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MANUFACTURING
IN
PHILADELPHIA

1683-1912

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THE COMMERCIAL MUSEUM

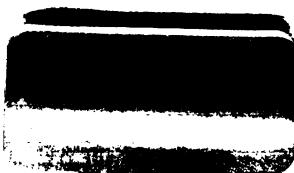
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Eugene P. Erickson and Wm. Gandy
"Work and Residence in Industrial Cities"
Journal of Urban History
Vol 5 No 2 Feb 1971



MANUFACTURING IN PHILADELPHIA

1683—1912

With photographs of some of the leading
industrial establishments

By JOHN J. MACFARLANE, A.M.
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Philadelphia Commercial Museum*



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THE PHILADELPHIA MUSEUMS

FOREWORD

IT IS not generally known that many of the leading manufacturing industries of the United States were first established in Philadelphia, still less is the present magnitude and importance of Philadelphia's industries realized. In publishing this book, the Philadelphia Commercial Museum hopes to give to those not familiar with the city a more correct idea of Philadelphia's manufacturing industries than they may now have.

Advantage has been taken of the recent publication of the United States Census of Pennsylvania to present detailed statements for all the Philadelphia industries given in the Census. This has been supplemented by photographs of a few of the leading manufacturing establishments.



TO VIMI
AVANTAGE





Roberts' Grist Mill, 1683

MANUFACTURING IN PHILADELPHIA 1683-1912

EARLY HISTORY AND DEVELOPMENT

The manufacturing industries of Philadelphia began soon after the arrival of the first settlers. The first grist mill in Philadelphia was erected in 1683 at Germantown by Richard Townsend who came over with Penn; it stood in Church Lane one mile northeast of Market Square and later was known as the Roberts mill. The early settlers were skilled in the weaving of linen and the manufacture of hosiery and other woolen goods. They raised their own flax and obtained the wool from their own sheep. Writing of the city as early as 1691 Penn said, "All sorts of paper are manufactured here in Germantown and very good German linen such as no person of quality need be ashamed to wear and very good druggets besides other woolen cloths."

TO MUSEUM AMERICAN

Because of the rapid development of manufactures in Pennsylvania, Acts of Parliament were passed to prevent manufacturing, and especially the exportation of manufactured products. One of the Governors of Pennsylvania in his report mentioned flour, lumber, iron nails, hats, leather and clothing as being manufactured in Philadelphia; he said they were only for domestic use and this seemed to satisfy the home government.

Manufacturing increased in the years following the Revolution and after the passage of the Embargo Act, in 1808 and the Non-Intercourse Law, in 1809, and also during the War of 1812, owing to the breaking off of the trade with Europe.

In 1809, in the first census of manufactures taken in the United States, Philadelphia was the only city reported separately, and the value of its manufactured products was \$10,000,000. Mease, in his "Picture of Philadelphia", published in 1811, said: "Philadelphia has long been celebrated for her various manufactures and they have much increased in variety and extent since the late interruption of our foreign commerce." His recapitulation of the industries of Philadelphia shows that at that early date it was celebrated for its textiles, leather, machinery, jewelry, malt liquors, sugar, pottery, glass, paper and hats. According to the Census of 1910, the value of the manufactured products of Philadelphia in 1909 was \$746,076,000, or seventy-five times as much as one hundred years before.

Philadelphia has reached its present prominence as a manufacturing center through the intelligence, pluck, energy and perseverance of her individual citizens. The patient work of its early settlers planted these industries, the untiring energy of those who followed made them prosper, and their present magnificent development is due to the individual merits of the leaders in the various lines of industries, for which Philadelphia is justly celebrated.

In the reports for 1904 and 1909 the Bureau of the Census omitted all establishments not operated on the factory system and all the so-called neighborhood and mechanical industries. In making comparisons with 1899 and previous years, therefore, it is well to bear this fact in mind. According to the methods in use prior to 1904, Philadelphia, in 1899, had 15,887 establishments employing 246,445 wage earners with an output valued at \$603,466,000, while according to the methods now in use there were, in 1899, only 7,503 establishments employing 214,775 wage earners with an output valued at \$519,982,000; the omission of more than one-half the number of establishments reduced the value of the output only 14 per cent and the number of employees only 13 per cent.



The Manufacturer's Club of Philadelphia

The following table gives a comparison of the reports for the last three census years for Philadelphia, omitting all establishments not operated on the factory system:

	Number of Establishments	Capital	Value of Products	Wage Earners	Wages
1899	7,503	\$445,725,000	\$519,982,000	\$214,775	\$94,737,000
1904	7,087	520,179,000	591,388,000	228,899	107,640,000
1909	8,379	691,397,000	746,076,000	251,884	126,381,000

During the ten years the value of the products increased \$226,094,000. From 1899 to 1904 the increase was \$71,406,000 and from 1904 to 1909 it was \$154,688,000, or twice as much as in the preceding five years. In 1909 the average wage was \$500 a year, or 13 per cent more than in 1899, when it was \$441.



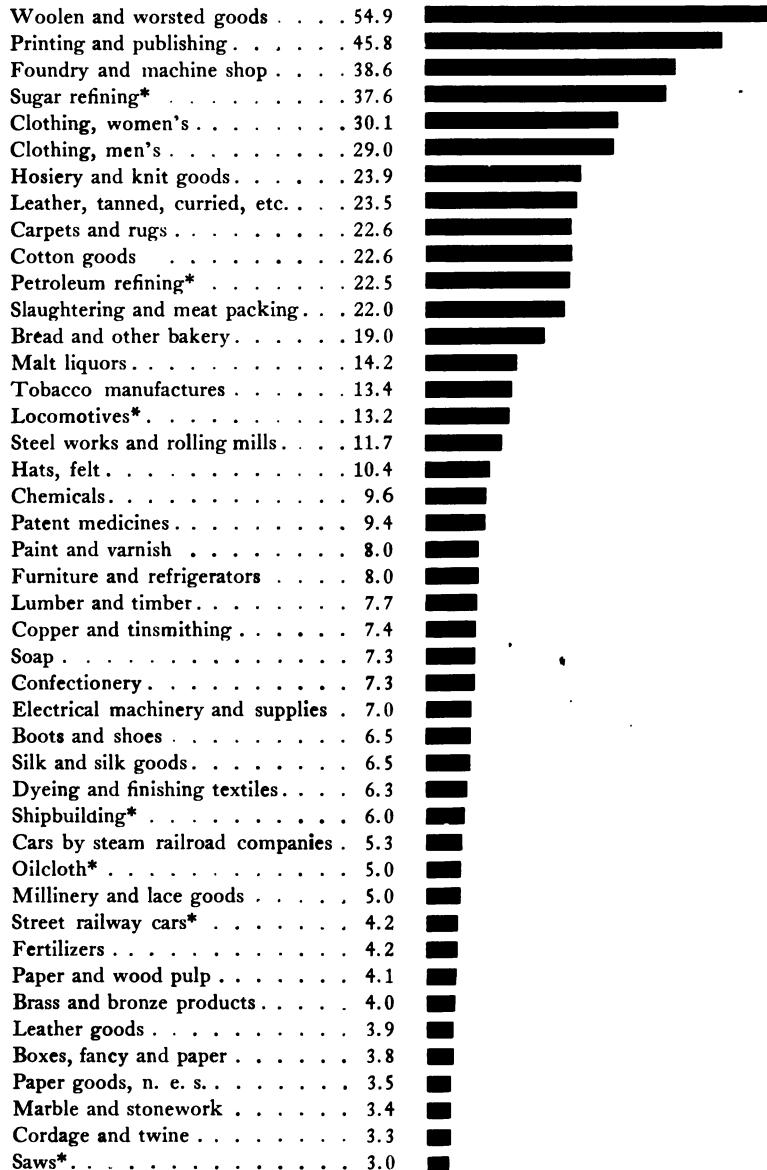
The United States Mint, Philadelphia

The Bureau of the Census of the United States divides the various industries into two hundred and sixty-four classes, of which two hundred and eleven are made use of in making this report on Philadelphia. Of these classes the seventy-one industries given in the table in the appendix are the only ones for which full details are available. The remaining one hundred and forty are, for various reasons, included under the head of "All other industries". Thirty-four of them had each a value of over a million dollars and four of them, over \$10,000,000 each. This great variety of industries is one of the causes of the industrial greatness of Philadelphia and distinguishes it from most other cities. In the production of manufactured products from raw materials, Philadelphia is far ahead of any other city.

LEADING INDUSTRIES OF PHILADELPHIA

Values in millions of dollars

1909



* Estimated; values not being given in the census tables



1



3



2



4

Philadelphia Locomotives in Foreign Countries

1, Bolivia. 2, China.

3, Korea. 4, Brazil.

Philadelphia was the leading manufacturing city of the United States until 1879, when it became second, being surpassed by New York. In 1899 it became third, being displaced by Chicago, which rank it held in 1909.

An Englishman, Arthur Shadwell, in a recent work on "Industrial Efficiency: A Comparative Study of Industrial Life in England, Germany and America," after having visited all the manufacturing centers of those countries said: "I have just called Philadelphia the greatest manufacturing city in the world and I believe it to be so. True it does not compare with such monstrous aggregations as London and New York, but they are not manufacturing cities in the same sense. They are primarily something else, and the manufactures are mainly accidental or secondary. They are there because the popula-



A Philadelphia Tram-Car in Brazil

tion and traffic is there. That is shown by their miscellaneous character and the small scale on which most of them are conducted. In the aggregate they employ a vast number of people and produce an immense quantity of goods, but individually they belong rather to the small than the gross industries. But Philadelphia is primarily a manufacturing place and the industries are carried on in very large establishments on a great scale."

The value of the output of the manufacturing industries of Philadelphia in 1909 was greater than that of any other city, excepting New York and Chicago, and was also greater than that of any state, excepting New York, Pennsylvania, Illinois, Massachusetts, Ohio and New Jersey.

While New York and Chicago exceed Philadelphia in the number of establishments and wage earners and in the amount of capital

and value of products, a large part of this excess is no doubt due, as Shadwell says, to the aggregation of smaller industries, as a result of their large population. In 1909 the average capital of each establishment in New York was \$52,600 and in Philadelphia, \$82,515, or 57 per cent more than in New York. The average number of employees to an establishment in New York was 21.3 and in Philadelphia, 30.0, or 40 per cent more than in New York. There are more establishments with 500 employees in Philadelphia than in any other city in the world.

The names of many Philadelphia firms are almost synonymous with the products they manufacture. The mention of locomotives suggests the name of Baldwin; of ships, that of Cramp; of cars, that of Brill; of saws, that of Disston; and of hats, that of Stetson.

The industries in which Philadelphia holds first, second, third and fourth rank among the cities of the United States in the value of products are as follows:

FIRST	SECOND
Hosiery and knit goods.	Sugar refining, excluding beet sugar.
Carpets and rugs other than rag.	Clothing, women's.
Hats, fur-felt.	Millinery and lace goods.
Locomotives.	Fertilizers.
Dyeing and finishing textiles.	Paper goods, not elsewhere specified.
Upholstering materials.	Umbrellas and canes.
Cars, street railway.	Mineral and soda waters.
Oilcloth and linoleum.	Petroleum refining.
Sporting and athletic goods.	Woolen, worsted, felt goods and wool hats.
Sand and emery paper and cloth.	Leather, tanned, curried, and finished.
Saws.	
Shoddy.	
Surgical appliances and artificial limbs.	

THIRD	FOURTH
Printing and publishing.	Clothing, men's, including shirts.
Foundry and machine shop products.	Cotton goods and cotton small wares.
Bread and other bakery products.	Patent medicines, drugs, etc.
Chemicals.	Furniture and refrigerators.
Paint and varnish.	Copper, tin and sheet-iron products.
Leather goods.	Soap.
Boxes, fancy and paper.	Confectionery.
Marble and stonework.	Electrical machinery, apparatus, etc.
	Furnishing goods, men's.
	Shipbuilding, including boat building.
	Food preparations.

TEXTILES

The manufacture of textiles is the most important industry in Philadelphia, their total value being over one-fifth that of all industries. Nearly one-third of all the wage earners in Philadelphia are engaged in the manufacture of textiles. The value of the output, in 1909, of some of the more important textile industries, is given in the following table:

Woolen and worsted goods	\$54,922,000
Hosiery and knit goods	23,971,000
Carpets and rugs	22,629,000
Cotton goods	22,538,000
Felt hats	10,402,000
Silk and silk goods	6,502,000
Dyeing and finishing textiles	6,327,000
Cordage and twine	3,325,000
Shoddy	1,846,000
Total	\$152,462,000



Folwell Bros. & Co., Woolen and Worsted Goods for Men's and Women's Wear

In addition to these are millinery and lace goods, \$5,000,000, and the following, the value of which have been estimated: oilcloth, \$5,000,000; men's furnishing goods, \$2,900,000; upholstering materials, \$2,600,000; also a number of smaller industries of less value.

If the average man were asked to name the principal textile manufacturing city of the United States, he would mistakenly mention one of two or three New England cities, yet the value of the combined output of the factories of the two largest textile cities of New England would fall far below that of Philadelphia. This mistake is due, in a great measure, to the fact that the textile cities of New England are

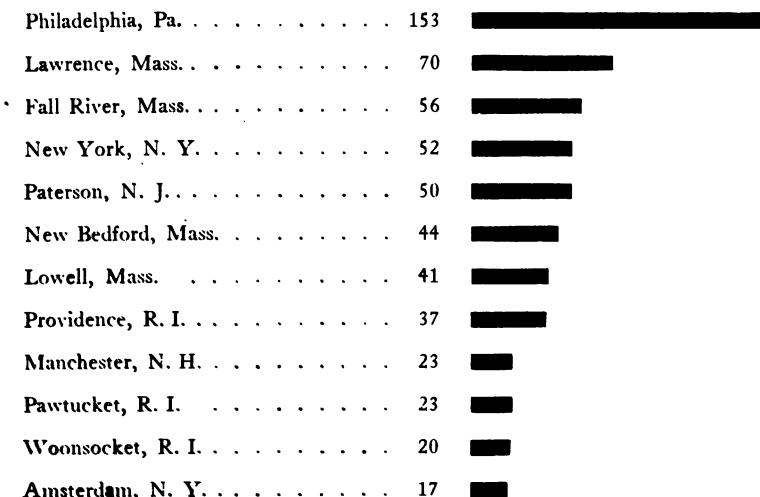
noted almost exclusively for this one line of manufacture, while Philadelphia's products are so varied and its reputation for other lines so world-wide that its great importance as a textile city is lost sight of.

In the following chart the value of the output of the textile products of the twelve leading textile cities of the United States in 1909, is given in millions of dollars. The textiles included are carpets, cordage, jute, linen goods, nets and seines, cotton goods, including cotton small wares, dyeing and finishing, hosiery and knit goods, shoddy, silk manufactures, woolen and worsted manufactures, wool pulling, wool scouring, felt goods, wool hats and fur felt hats.

LEADING TEXTILE CITIES OF THE UNITED STATES

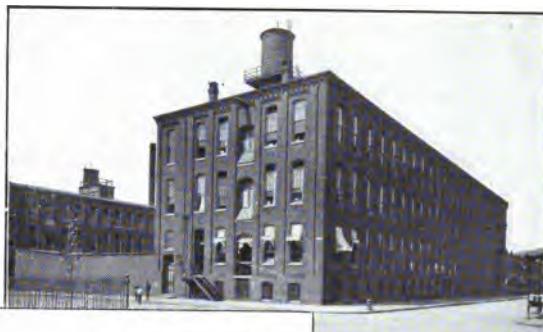
Values in millions of dollars

1909

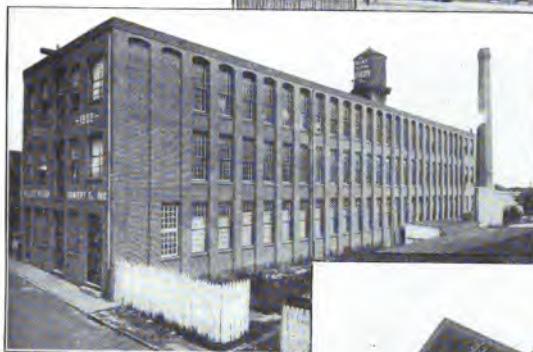


While some may question the right of Philadelphia to be called the largest manufacturing city in the world, none can successfully dispute the statement that it is the largest textile city in the world. The total value of the output of the textile industries of the United States in 1909 was \$1,684,636,500, or \$200,000,000 more than all of Great Britain and Ireland. From the chart it will be seen that Philadelphia produces nearly one-tenth of all the textiles of the United States, or more than any other two cities combined. The value of its textiles is greater than that of any other city of the world.

John Blood & Co.
Hosiery



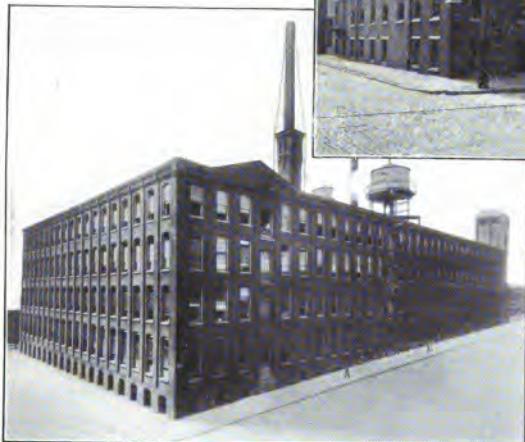
Wallace Wilson
Hosiery Company



Marlborough
Hosiery Mills



Powell
Knitting Company



HOSIERY AND KNIT GOODS

The hosiery industry of the United States had its beginning in Germantown, a part of Philadelphia, soon after Penn's arrival, in 1683. The Mennonites and other Germans from the Palatinate, who settled in or near Germantown, brought with them their crude frames and set them up in their homes. The men operated the frames while the women sold the stockings, frequently going to Market Street in the city to dispose of them. They were made mainly of woolen yarn and sold for a price about equal to one or two dollars per pair in our money.



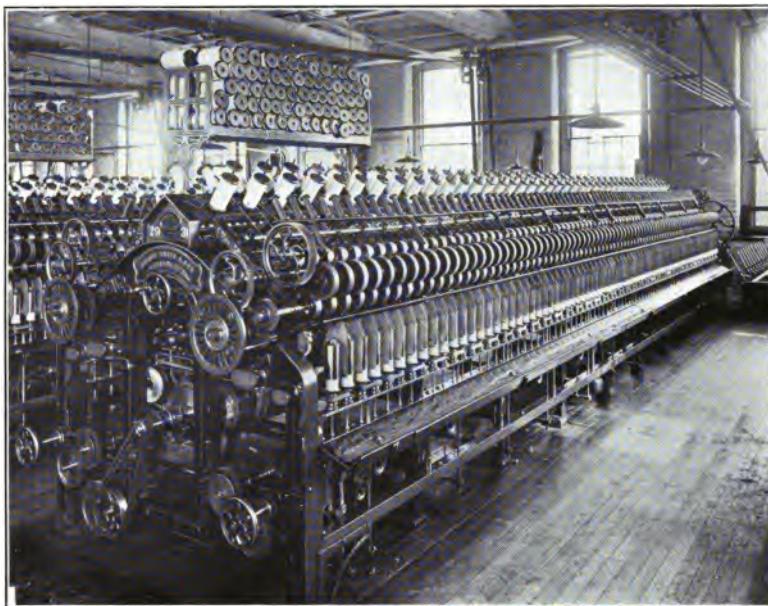
Making Stockings—German-American Hosiery Co.

The industry flourished as their methods were improved from time to time and with their crude frames they were able to supply the demand until the early part of the nineteenth century. At that time a number of English knitters settled in Germantown, bringing with them their improved frames. They soon secured the bulk of the trade. Thomas R. Fisher, about 1825, collected a number of machines under one roof, the selling being done by one person. Prior to that the industry was carried on entirely in the homes of the knitters.

This was the first knitting mill in the United States and was located at Fisher's Hollow, now Fisher's Lane Station, on the Reading

Railroad. Shortly after, Fisher offered to buy the frames, but their owners refused, feeling that as long as they owned their frames they were sure of a living. He then bought frames in England and had English knitters come over to operate them. For many years Germantown was the leading hosiery section in Philadelphia, but now Kensington exceeds it in the number of hosiery and knit goods mills.

Although the total output of Philadelphia hosiery mills is only about 12 per cent of that of the whole country, yet Philadelphia manufactures more hosiery and knit goods than any other city in the United States. The value of its output in 1909 was \$23,971,000, an increase of 83



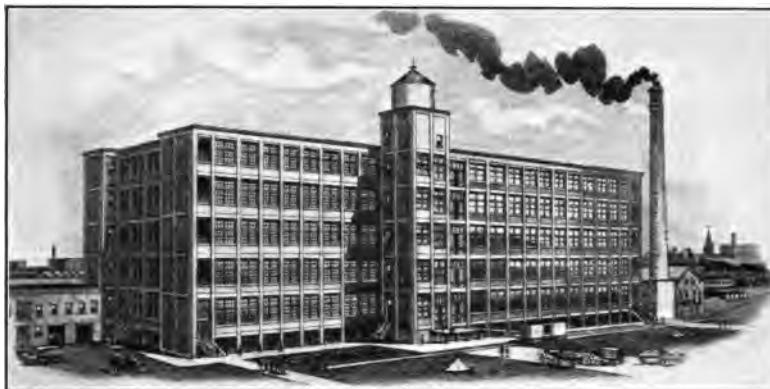
Spinning Wool—Yewdall & Jones

per cent over that of 1899, when it was \$13,074,000. The value of all hosiery and knit goods manufactured in Great Britain in 1907 was \$42,747,000, or less than in Pennsylvania in 1909, when the value was \$49,658,000.

There were 14,167,100 dozen pairs of hose of different kinds made in Great Britain in 1907, or about the same as in Philadelphia in 1909. In 1912 of the one hundred and forty-nine hosiery and knit goods mills in operation in Philadelphia, eighty-three are making hosiery; thirteen, underwear; eighteen, neckties; and thirty-three, sweaters, jackets and other knitted wear.

WOOLEN, WORSTED AND FELT GOODS

The value of the woolen, worsted and felt goods and woolen hats made in Philadelphia exceeds that of any other class of goods. Woolen cloth was made in New England before the settlement of



Wolstenholme & Clark—Worsted Yarns

Pennsylvania, but the early settlers of Pennsylvania from Holland, Germany and England were familiar with the process of manufacturing woolen cloth, and at an early date erected fulling mills, of which there were twelve in 1760.



Thos. Wolstenholme—Worsted Yarns

In 1688 the price of spinning worsted was two shillings a pound and for weaving, half a yard wide, was twelve pence per yard. In 1775 Samuel Wetherill, who had the contract for supplying the army with cloth, had a factory near Fifth and Arch Streets. In 1810 there

were three woolen mills in the city and one at Germantown, one making cassinette and the others, broadcloth of merino wool. In those days every good farmer kept sheep, and woolen cloth was the chief fabric for family wear. It was carded, spun and woven at home. The best clothes were made of fulled cloth, the home-made materials being taken to the mill for fulling, dyeing and finishing.

Philadelphia has always ranked high in this industry, being first in 1899 and 1904, and second in 1909. In the latter year the value was \$54,922,000, an increase of \$20,340,000, or nearly 60 per cent in ten years. The census details for Pennsylvania given below will give an idea of the quantity, value and kinds of goods made in Philadelphia.



Jonathan Ring & Son, Inc.—Wool and Merino Yarns

The total value of the combined products in the State of Pennsylvania was \$77,446,996 in 1909, as compared with \$48,765,445 in 1899, a gain of \$28,681,551, or 58.8 per cent during the decade. Of this gain, \$20,340,000, or 70 per cent, was in Philadelphia. The value of the products of the woolen branch in Pennsylvania decreased from \$25,389,344, in 1899, to \$16,033,077 in 1909, while the value of the products in the worsted branch increased from \$22,109,132 in 1899 to \$59,416,106 in 1909. These figures show clearly the decline in the woolen branch of the industry and the marked growth in the worsted branch.

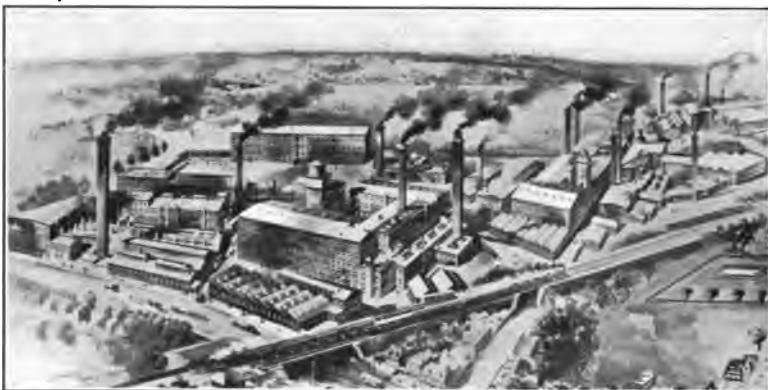
One of the striking features is the increase in the production of all-wool woven goods, the output of which in Pennsylvania increased from 19,498,412 square yards, valued at \$10,776,645, in 1899 to 33,149,873 square yards, valued at \$22,653,317 in 1909, a gain of 70



Fern Rock Woolen Mills

per cent in quantity and of 110 per cent in value. The largest part of this gain was in worsted dress goods, for which Philadelphia is especially celebrated, although worsted suitings and overcoatings also increased.

Wool and cotton mixed goods decreased from 17,389,245



John and James Dobson's Carpet Mills

square yards in 1899 to 5,104,428 square yards in 1909, a loss of 70.6 per cent. Worsted-filling cassimeres, tweeds and suitings increased from 631,131 square yards in 1899 to 8,347,362 square yards in 1909.

The quantity of woolen yarns decreased from 29,161,975 pounds to 25,211,815 pounds, a decline of 14 per cent, and this decrease would be greater if it were not for carpet yarns which make up a large part of the woolen yarns manufactured. Worsted yarns increased from 16,813,647 pounds in 1899 to 28,656,142 pounds in 1909, an increase of 70 per cent.

Of the one hundred and forty-nine woolen and worsted mills in Philadelphia in 1912, sixty-six are manufacturing yarn; sixty-one, dress goods and men's wear and eight, blankets. Sixteen of the yarn mills manufacture carpet yarn, and fifteen, knitting yarn. So many of the mills are given as manufacturing woolen and worsted yarns, that it is difficult to say how many are now only making worsted yarns.

Philadelphia is one of the largest wool markets in the United



John Bromley & Sons—Carpets and Axminster Rugs

States. More than one-fifth of all the wool, both domestic and foreign, used in the manufacturing industries of the United States, is consumed in Pennsylvania, most of which should be credited to Philadelphia. The large number of wool warehouses along Front Street and on Chestnut and Walnut near Front, brings out clearly the importance of Philadelphia as a wool center.

CARPETS

The first carpets made in the United States were by William Calverly at Philadelphia in 1775. He was followed by William P. Sprague, who made Turkish and Axminster carpets in Philadelphia in 1791, and furnished a hand-made tufted carpet adorned with patriotic emblems for the floor of the United States Senate. This caused Alexander

Hamilton to place a tariff of from five to seven and a half per cent on all such imported products so as to encourage their home manufacture. This was the beginning of the policy of tariff for the protection of home industries that has done so much to develop manufacturing in the United States. The continuance of this policy has made us the greatest manufacturing country in the world.

These earlier mills, however, were not the founders of the present carpet industry in Philadelphia, as they later drifted into the manufacture of oilcloth. The present industry owes its start to the large immigration of weavers from England, Scotland and the north



Bundhar Carpet Weaving—Hardwick & Magee Co.

of Ireland between 1830 and 1860. Most of the weavers settled in Kensington and caused a rapid increase in the manufacture of carpets, especially ingrains.

In 1909 the value of the carpets made in Philadelphia was \$22,-629,000, or 30 per cent of the total value of all carpets made in the United States. According to the British Census, the value of all carpets and rugs made in Great Britain and Ireland in 1907 was \$19,-387,000, or \$3,000,000 less than in Philadelphia alone in 1909. The total quantity made in Great Britain and Ireland was 30,000,000 square yards against 32,000,000 square yards in Philadelphia.



Dornan Bros. Carpets



Hamilton Mills—Carpets

Ingrain carpets made up more than one-half of all the products of the Philadelphia mills. In 1909 there were 18,722,998 yards of ingrain carpets and rugs made in Philadelphia, or 78 per cent of the total production of this class of goods for the whole country. During the last ten years there has been a great decrease in the quantity of ingrain carpets, so that less than one-half as much was made in 1909 as in 1899. At the same time there has been a great increase in ingrain rugs, more than twice as much being made now as ten years ago. There has been a large increase in the manufacture of Axminster, Wilton, Brussels and velvet carpets. Of the seventy-seven mills in operation in 1912, there are thirty-five manufacturing ingrain



Philadelphia Tapestry Mills

carpets; twenty-four, Brussels and other high-grade carpets; eighteen, rugs; and ten manufacturing rag and fiber carpets and rugs. Nearly all of these are in the Kensington district.

COTTON MANUFACTURES

It is not generally known that Philadelphia, though settled by Penn sixty years after the New England States, early held a prominent position in the manufacture of cotton goods. The first spinning-jenny seen in this country was exhibited at Philadelphia in 1775. The first joint stock company in the United States and probably the first company to make cotton goods was organized in Philadelphia in 1775,

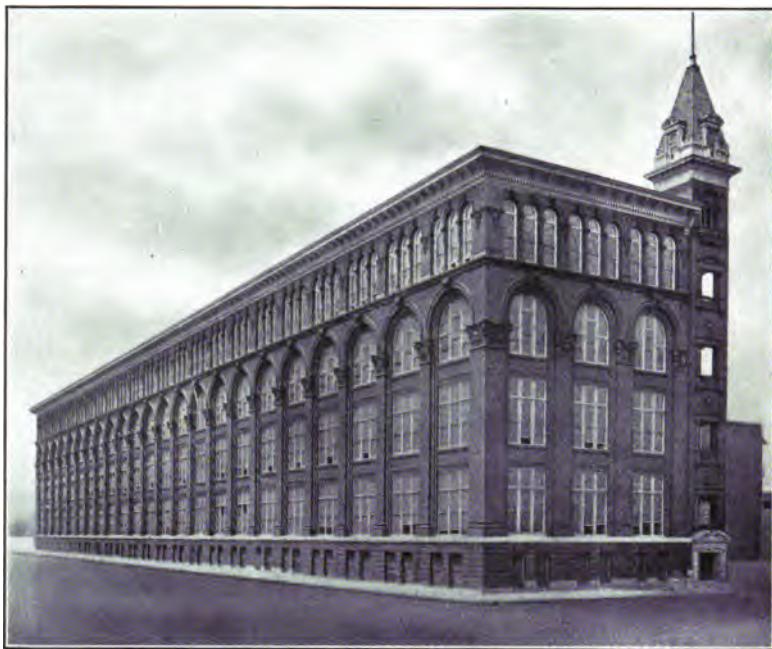
and known as "The United Company of Philadelphia for Promoting American Manufactures." Slater, the pioneer of the cotton manufacturing industry in New England, was induced to come to this country through a notice in a newspaper that the Pennsylvania Legislature in 1788, had granted a premium of £100 to John Hague for introducing a machine for carding cotton. The first calico printing done in the United States was in 1789 at Philadelphia by John Hewson, a Revolutionary soldier. General Washington was accustomed to point with patriotic pride to the domestic fabrics upon the person of Mrs. Washington from the establishment of John Hewson.



C. J. Milne & Sons—Cotton Piece Goods

The first lot of cotton goods printed by engraved rollers and machinery driven by water power was turned out by the works of Thorpe, Siddal & Co. in the suburbs of Philadelphia in 1810. To-day the application to cotton textiles of colored designs by means of cylinder rollers, the process being known as cylinder printing, has become a well fixed feature of the Pennsylvania industry.

In the New England cities the mills confine themselves mainly to the manufacture of cotton piece goods and yarns. Very little white piece goods, which form a large part of the New England product, are made in Philadelphia.



North American Lace Company



Making Lace—Quaker Lace Company

It was Philadelphia manufacturers who discovered the value of cotton as a decorative adjunct, and conceived and made into beautiful textures a vegetable fiber formerly unknown in decoration. It was from 1880 to 1890 that cotton chenille was found applicable to window curtains. Later the manufacture of tapestries and covers for pianos and tables and other minimum light fabrics was developed and became a great industry.

LACE

The manufacture of cotton lace and lace curtains is largely confined to Philadelphia. The Bromley lace mills take precedence as the first serious effort made to weave laces in the United States. At first it was difficult to get the skilled Nottingham weavers to leave England, but the Bromley mills were finally able to offer them sufficient inducements, and in this way was started cotton lace weaving in the United States. The old world lace centers, Nottingham, Calais, Plauen and St. Gall, can no longer claim superiority to Philadelphia in the quantity or quality of their output, for this city to-day has some of the largest lace factories in the world, and the products are equal in style to the finest foreign lace. Of the total production of tapestry, lace and lace curtains in the United States in 1909, 90 per cent of the tapestry and nearly 80 per cent of the lace was made in Philadelphia. The mill of the Quaker Lace Company, at Twenty-second and Lehigh Avenue, is said to be the largest lace manufacturing mill in the world.

By an Act of Congress passed in 1909, embroidery and lace-making machinery was admitted free until January 1, 1911. During that period over \$3,000,000 worth of embroidery and Lever or Gothrough lace-making machines was imported into the United States; a large number of these were imported for Philadelphia lace firms. The values for 1909, therefore, do not reflect the present condition of the lace industry of Philadelphia, as there has been a great increase in the output of the lace mills since the introduction of the new machinery.

The production of lace from 1899 to 1909 more than doubled in quantity and value, being for the state 66,867,709 yards in 1909 against 30,925,198 in 1899 and \$7,238,000 in 1909 against \$3,028,000 in 1899.

The value of the output of the cotton industry in Philadelphia in 1909 was \$22,629,000, or about two-thirds of that for Pennsylvania, which was \$33,917,033. No details are given for the city, but those for the state will indicate the progress of the industry in the city.



S. B. & B. W. Fleisher, Inc.—Braids and Yarns



Friedberger-Aaron Mfg. Company—Braids and Laces

Of the \$33,000,000 worth of cotton goods made in Pennsylvania in 1909, \$7,238,000 was the value of the lace; \$4,163,683, the value of tapestries; and \$1,072,348 that of all other upholstery goods, or a total of \$12,473,000 for upholstery goods. Fancy woven fabrics amounted to \$5,119,000. Philadelphia leads all other cities in the manufacture of what are known as cotton small wares such as braids, tape and webbing. The value of the tape and webbing manufactured in the United States in 1909 was \$5,531,000, of which \$2,141,000 was the value in Philadelphia. Since 1909 there have been a number of very large mills erected for the manufacturing of braids and similar kinds of goods so that the value of these products in 1912 will be very much greater than in 1909. Philadelphia also ranks first in the manufacture of upholstering materials.

Of the one hundred and sixty mills in Philadelphia in 1912



Wm. H. Horstmann Company—Silk Yarns and Trimmings

regularly manufacturing cotton goods, twenty-seven are making upholstery goods; twenty, cotton small wares; twenty, cotton yarn; seventeen, piece goods; twelve, towels; ten, lace and lace curtains; six, felts; five, hammocks; five, cotton cordage; and five, cotton thread, showing only about one-tenth employed in manufacturing piece goods.

SILK

The first silk manufacturing plant in the United States was that of William H. Horstmann, who in 1816 started the manufacture of silk trimmings at Third and Arch Streets, Philadelphia. He also, in 1824, introduced the first Jacquard machine into the United States. The

management has continued in the same family to the present time. They originally manufactured silk trimmings, but now with six hundred employees they make a great variety of other classes of silk goods, including narrow fabrics, regalias, flags, etc. When the Government asked for bids to supply the army with national and regimental flags at the opening of the Spanish War, they were the only bidders, no other company being able to meet the requirements of the Government as to time and quality.

While Philadelphia does not rank high in the manufacture of silk, the State of Pennsylvania makes almost as much as New Jersey, each producing about one-third of all the silk manufactured in this



Sauquoit Silk Mfg. Co.

country. The value of the products in New Jersey in 1909 was \$65,429,000 and in Pennsylvania, \$62,061,000, all other states producing \$69,000,000. The value of the total production of the United States in 1909 was \$196,425,000, or more than that of France.

The value of the output of the silk industry in Philadelphia in 1909 was \$6,502,000, or \$2,000,000 more than it was ten years before. There were thirty-two silk factories in Philadelphia in 1909 and forty in 1912. Of the latter, fourteen are engaged in the manufacture of dress trimmings; eight, ribbons; seven, upholstering materials; and five, broad silks. One of the largest silk mills in the state is the Sauquoit mill with four hundred looms and twenty thousand spindles.

CORDAGE

The cordage industry started early in the history of Philadelphia, ropewalks being established a few years after the arrival of Penn. Up to 1850 this was the method of manufacture, but now a large part of



Edwin H. Fitler Company—Cordage

the work is done by machinery. Formerly it was confined mainly to supplying ropes for ships, but the invention of the self-binding harvester gave a new direction to this industry.

It was told of Deering that in 1878, when he was looking for a



Schlichter Jute Cordage Company

twine to be used in his self-binder, he called on Edwin H. Fitler, head of the Fitler Cordage Works, Philadelphia, and explained what he wanted. From the unassuming way in which Deering stated his

needs, Fitler concluded that the order would be a small one. "What you want," said he, "is a single strand twine, which cannot be made without a new line of machinery. I regret to say that I cannot afford to do this for one customer." "Well," said Deering, "I think I may need a good deal in the long run, though I wish to begin with not more than ten carloads." Ten carloads! For a moment Fitler was dazed, but only a moment. It was his chance and he knew it. Years afterward, he was fond of telling how he "made a million-dollar deal with William Deering in two minutes." The demand for binder twine has grown since that date to such propor-



Twisting Twine—John T. Bailey Company

tions that the manufacture of it now is one of the most important parts of the cordage and twine industry.

Originally, hemp and flax were the only fibers used in the manufacture of rope, then came Manila hemp, sisal, ixtle and jute, so that now very little is made from hemp and flax; jute, Manila hemp and sisal being the leading raw materials. In 1899 there were thirteen cordage factories in Philadelphia with an output valued at \$6,162,000; in 1909 there were only eight, with an output of \$3,325,000. In 1912 there are twelve, most of them being located in Frankford and Bridesburg.

OILCLOTH AND LINOLEUM

Bishop, in his "History of American Manufactures", states that in 1807 a manufactory of a new article of patent floor cloth or summer carpet was in operation in Philadelphia. He describes it as strongly woven on a seven-yard loom, without a seam. They were furnished plain or in colors at from \$1.25 to \$2.00 a yard, and when partly worn could be re-coated, painted or ornamented, and with appropriate borders. Old woolen or worsted carpets could be coated on one side at half price. This was manufactured in works carried on by John



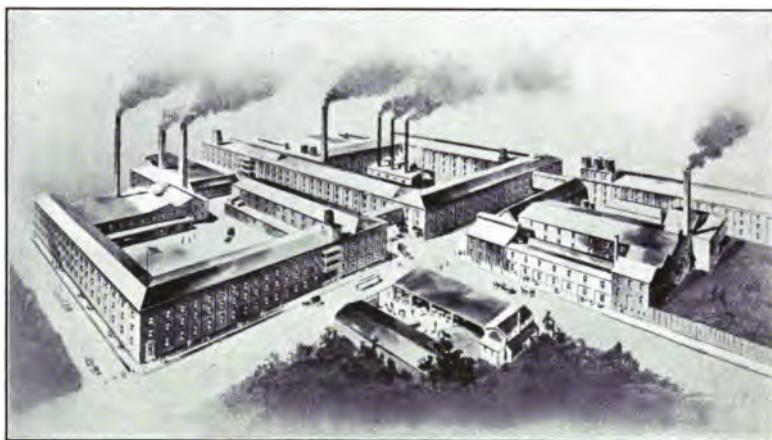
From Burlap to Linoleum—Factory of Thos. Potter Sons & Co.

Dorsey and was the first attempt to make oilcloth in the United States. He was succeeded by Isaac Macauley, who built up a large business in this line of goods, but owing to the great cost of manufacture and the slight demand he was unable to continue in the business. Thomas Potter of Philadelphia purchased the plant, which was near the present location of the United States Mint, and was known as the Bush Hill Oilcloth Factory; the present plant of Thos. Potter Sons & Company in Northeast Philadelphia is one of the largest in this country.

While oilcloth for floor covering was first manufactured over one hundred years ago, the manufacture of linoleum is of much more

recent date. Thirty years ago there was but one linoleum factory in the United States, that of the American Linoleum Company, chartered in 1872. The second American mill to make linoleum was the George W. Blabon Company, of Philadelphia, which, with its national reputation for floor oilcloths, lost no time in adding linoleum, and modern machinery was introduced at their Nicetown plant as quickly as possible. The Blabons also perfected and installed the first successful oilcloth and linoleum printing machine in 1887.

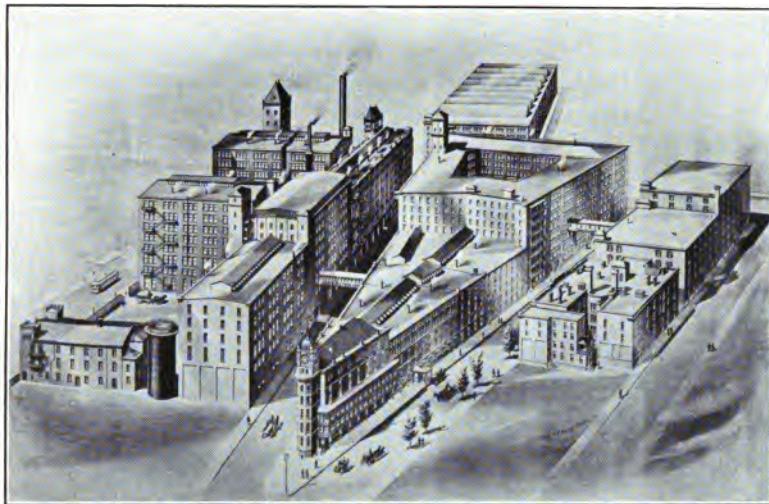
Thos. Potter Sons & Company, whose floor oilcloths were known in every state, installed linoleum machinery in 1890 and took its first orders in the fall of 1891. Inlaid linoleums, which were asserting themselves so strongly, received special investigation



Firth & Foster Company—Dyeing and Finishing Piece Goods

and machinery for their production was installed in due time, and inlaid linoleums were turned out in the year 1895.

As practically all the oilcloth and linoleum made in Pennsylvania is the product of the two large factories in Philadelphia, the Government does not give any statistics for this industry in Pennsylvania, as to do so might reveal to a rival the condition of a competitor's business. The value of the total output for the industry in the United States in 1909 was \$23,339,000; that of New Jersey amounted to \$10,143,000 and New York to \$3,522,000 and other states outside of Pennsylvania to less amounts. From the best information available at the present time the value for Philadelphia is estimated at \$5,000,000. Philadelphia leads all other cities in the value of oilcloth and linoleum.



Stetson Hat Factory

General Baden-Powell
in Uniform
Wearing a Stetson Hat



Window Display of Stetson Hats
Sydney, Australia

HATS

The manufacture of hats is an old Philadelphia industry. In earlier days the Germantown beaver hat was well known throughout the United States and some were exported. This was entirely a hand-made industry; the introduction of machinery resulted in its being carried on more extensively but in the central part of the city.

In 1865 Stetson began the manufacture of hats of a quality and style not previously made, and now has the largest and most complete factory in the world. The plant covers five acres and has a floor space of twenty-five acres. The employees number four thousand



Jacob Miller Sons & Co.—Shirts

men and fourteen hundred women. The entire world is scoured for materials—hare skins from Germany, rabbit skins from Scotland, the nutria from Argentina, and the beaver, otter and muskrat from the United States and Canada. In 1911 there were 11,500,000 skins used in making 3,336,000 hats.

This factory is one of the show places of industrial Philadelphia, not only because of its magnitude and the world-wide fame of its product, but also because in no other single factory in the world can be seen all the processes of hat manufacture from the raw fur-bearing skin to the finished hat. This firm supplied the hats for the Northwest mounted police of Canada. General Baden-Powell, having seen

those worn by the Canadian police, had his troops in the Boer War supplied with these hats. The Stetson hats may be found in all quarters of the globe; over eleven hundred storekeepers in foreign countries carry this make of hats. The largest foreign markets are Argentina, Mexico, Canada, South Africa, Australia and Europe.

During the last ten years this industry has made rapid progress, and Philadelphia to-day makes more hats than any other city in the United States. The value of the fur felt hats made in Philadelphia in 1909 was \$10,402,000. According to the British Census the value of felt hats made in Great Britain and Ireland in 1907 was



Making Clothing for Export—Snellenberg Clothing Company

\$10,049,000. These include hats for men, women and boys and also wool hats. There were 832,000 dozen felt hats made in the United Kingdom in 1907, and 668,000 dozen in Philadelphia in 1909.

OTHER TEXTILE INDUSTRIES

The dyeing and finishing of textiles has been carried on in Philadelphia for a long time. The textiles of other cities are sent here to be dyed and finished, which with those from the city itself make an important industry. The value of the output in 1909 was \$6,327,000, or more than that of any other city. Some establishments, like that of Firth & Foster, have their entire plant devoted to piece goods dyeing and finishing.

There are a number of industries such as men's furnishing goods, awnings, hammocks, etc., all of which combined add considerable to the value of the textile industries of Philadelphia.

CLOTHING

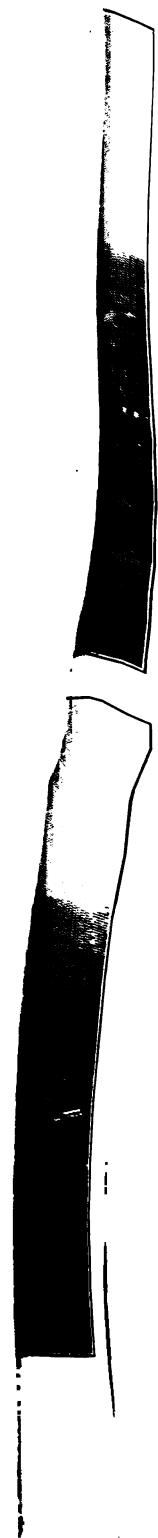
The manufacture of clothing, while not strictly a textile industry,



is closely allied to it, owing to the fact that the materials used are textiles. Philadelphia clothing is well known for its excellent quality and is fast coming to be recognized as the most serviceable and at the same time the most fashionable. So successful have the Philadelphia manufacturers been that in 1909 there were four hundred and fifty-six

UNIV. OF
CALIFORNIA

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establishments manufacturing men's clothing, including shirts, the value of the output being \$29,000,000, an increase of \$6,300,000 over 1899, when it was \$22,700,000. In 1909 the classification "men's clothing" included shirts. In 1899 the value of shirts was given separately and amounted to \$5,000,000, and that of men's clothing amounted to \$18,000,000.

Fifty years ago the manufacture of women's clothing was so small as not to be noticed even in the census reports, and was then a hand-made industry. To-day ingenious machinery has replaced nimble fingers, and suits are now turned out by the thousands where one was turned out then. The growth of this industry in Philadelphia has been phenomenal. In 1899 there were one hundred and ninety-one establishments, with an output valued at \$9,452,000. In 1909 there were three hundred and fifty-one establishments, with an output valued at \$30,133,000, or more than three times as much as ten years before. This rapid growth has placed Philadelphia second only to New York in the value of the output of women's clothing. There were 12,215 wage earners employed in the manufacture of men's clothing and 13,500 in women's clothing in 1909.

If a comparison is made of the value of the output in Pennsylvania of the most important industries considered under the head of textiles, with their value in Philadelphia, it will be found that the value of the output in the city is nearly sixty per cent of that of the state. Ninety per cent of the value of the women's clothing made in Pennsylvania in 1909, eighty per cent of the value of the carpets and of felt hats, seventy-three per cent of the value of men's clothing, seventy per cent of the value of the woolen and worsted goods and of cordage and twine, sixty per cent of the hosiery and knit goods, and fourteen per cent of the silk and silk goods were made in Philadelphia.

From the tower of the Bromley Mill at Fourth and Lehigh Avenue there is within the range of vision more textile mills than can be found in any other city in the world. For miles in every direction is seen the smoke of thousands of mills and factories. To the northeast one continuous line of factories extends through Frankford to Tacony, six miles away. To the northwest through the smoke rising from the Midvale works at Nicetown the mills of Germantown are seen. To the west another line of mills stretches to the Falls of Schuylkill and Manayunk. To the southwest is Baldwin's and other foundries and mills of that section. To the south are the hat and leather factories and to the southeast is Cramp's Shipyard and the numberless industries clustered along the river. Beyond all these are the mills and factories of South and West Philadelphia, some of them eight miles away.

MANUFACTURES OF IRON AND STEEL

The manufactures of iron and steel and the various products of which they form an essential part are next in importance to that of textiles. Owing to the fact that in many of the lines the census does not give the details, it is impossible to state the exact value, but



A 22500 Horse Power Turbine—Made by The I. P. Morris Co.

in 1909 it reached \$100,000,000. The following table shows the value of the output in those industries for which statistics are available:

Foundry and machine shop products	\$38,685,000
Locomotives	13,000,000
Rolling mill products	11,789,000
Electrical machinery	7,065,000
Ships and shipbuilding	6,000,000
Saws	3,000,000
Stoves	2,070,000
Cutlery and tools	1,686,000
Files	1,540,000
Safes and vaults	493,000
Total	\$85,328,000

In addition to these there were four industries, in each of which the value of the products amounted to between one and five million

dollars: namely, agricultural implements; Babbitt metal; bolts, rivets, etc.; tin and terne plate. There were also a number of other industries, the value of whose products was less than a million.

At one time Philadelphia was the leading city in the manufacture of iron and steel products, but now, owing to the easy access to a supply of cheap ore at Lake Superior, Pittsburgh and Chicago out-rank Philadelphia, Pittsburg leading in the output of blast furnaces and rolling mills and Chicago, in foundry and machine shop products.

The leading industry of this class in Philadelphia in 1909 was foundry and machine shop products, which includes all kinds of



'Wyoming,' Largest Battleship Afloat—Made by Cramp Ship Building Company

machinery. There were five hundred and forty-five establishments with an output valued at \$38,685,000. The manufacture of machinery in Philadelphia began before the Revolution. Christopher Colles made the first successful experimental steam engine in America in Philadelphia in 1773. One of the first steam engines put to practical use in manufacturing in the United States was made in Philadelphia in 1801 by Oliver Evans, and for a long time Philadelphia was the center of the manufacture of stationary engines and boilers. Cotton machinery was made in 1810 by Jenks, an associate at one time of Slater, who did so much to develop the cotton industry in

New England. Owing to its diversified industries, there is probably a greater variety of machinery made in Philadelphia than in any other city of the United States. Philadelphia machinery has always had a high reputation and machine tools, sugar, knitting and other machinery are exported to all parts of the world.



Baldwin Locomotive Works

LOCOMOTIVES

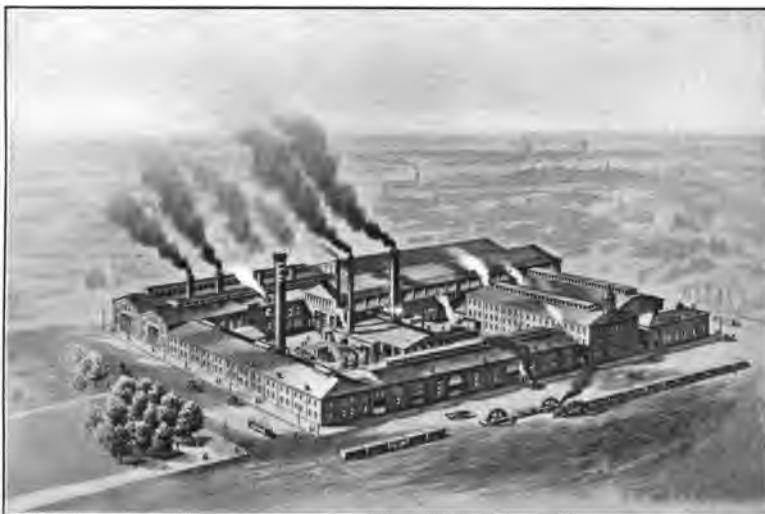
The manufacture of locomotives is the most important single industry under the head of iron and steel. In this, Philadelphia holds the first rank. The Baldwin Locomotive Works is the oldest and largest establishment manufacturing locomotives in the United States. The first entry of Mr. Baldwin, who was a silversmith, into this line of work was to prepare a toy locomotive for the Peale Museum in Philadelphia. This firm turned out the first successful locomotive, "Old Ironsides," in 1832, for the use of the Germantown and Norristown Road. The following advertisement of this locomotive is interesting: "The locomotive engine built by Mr. M. W. Baldwin of this city will depart daily when the weather is fair with a train of passenger cars. On rainy days horses will be attached in the place of the locomotive." Times have changed. Horses are now more likely to be used on pleasant days, while locomotives are considered strong enough to stand all kinds of weather.

The Baldwin plant in Philadelphia covers an area of seventeen acres, and that at Eddystone, near Philadelphia, two hundred and twenty-four acres. In busy years it employs 19,000 men and turns out about 2,500 locomotives, or an average of eight a day. The output of one year would be capable of hauling 168,000 loaded cars of

fifty tons each, which if stretched out in one line would reach from Philadelphia to Omaha.

The story is told of a member of this firm who, when visiting Vienna, was asked by a prominent gentleman who was showing him the sights of the city, if he would not like to see their plant for building locomotives, which was so large that it turned out one whole locomotive a day. This to a member of a firm which at that time was turning out three and a half in a day seemed somewhat ridiculous.

The value of the output of the Baldwin Works in 1909 was \$13,000,000, or nearly half that of the United States. That year was an exceedingly lean one in this industry, the output in 1905 being



Southwark Foundry and Machine Company

\$40,000,000 and in 1906, \$46,000,000. Last year it turned out 1,675 locomotives, valued at \$26,000,000, of which 188, valued at \$2,500,000, were exported; this was more than one-half the number and 80 per cent of the value of all the locomotives exported from the United States during the last fiscal year.

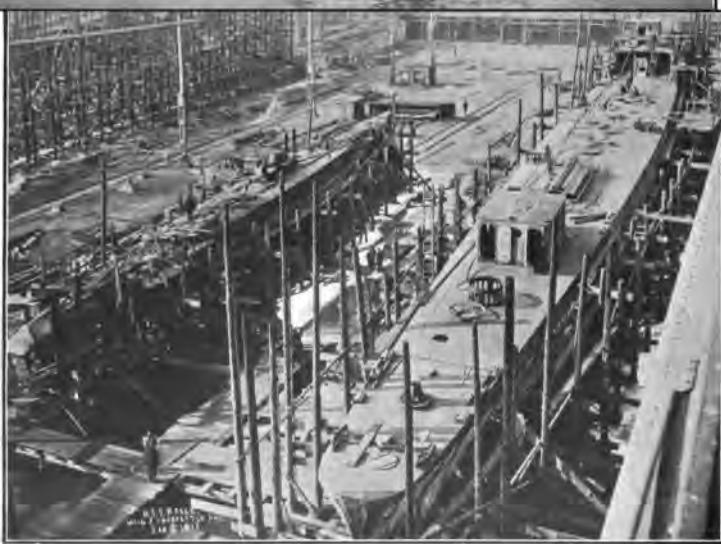
Baldwin locomotives are to be found in practically every country of the world—Siberia, Japan, Korea, India, Australia, Mexico, Central America, Argentina, Brazil, Colombia and other South American countries, and even in the newly developed territory of Uganda in Africa. A Philadelphian at Jaffa will find a Baldwin locomotive ready to carry him to Jerusalem. More than one hundred and fifty railways outside of the United States are using Baldwin locomotives.



1



2



3

AT THE CRAMP'S SHIPYARD
1—Launching a Submarine. 2—Cruiser "Cuba." 3—A Submarine and a Destroyer

SHIPBUILDING

Some persons entertain the belief that the predominance of Philadelphia in shipbuilding is of recent date and due largely to the radical changes in material and conditions of construction. The reverse is true. There has never been a day from 1710 to date when Philadelphia was not in the lead in everything pertaining to naval architecture, and since the advent of the steam era, in marine engineering. The beginning of shipbuilding in Philadelphia was almost coincident with the settlement made under William Penn. Within three years after Penn signed his charter he built in Philadelphia a ship called the "Amity," and ever since; despite the decadence of the American merchant marine, shipbuilding has borne an important part among the industries that line the Delaware river. In 1775 Philadelphia was the leading center for the building of ships, its preeminence being due to the immense shipping trade carried on between this city and the West Indies. In 1793 twice as many ships were built in Philadelphia as in any other locality in the United States. The first steamboat in this country was launched on the Delaware river in 1786, and in 1809 steam navigation began its continuous existence at this point. Next to the Clyde river, in Scotland, the Delaware river is now the great shipbuilding stream of the world. Builders on this river have been prominent in the construction of war vessels for the Government. The first six ships of the navy were designed by a Philadelphia shipbuilder, Joshua Humphreys, and of the steel ships recently built for the Navy, more have been constructed at Philadelphia than at any other point.

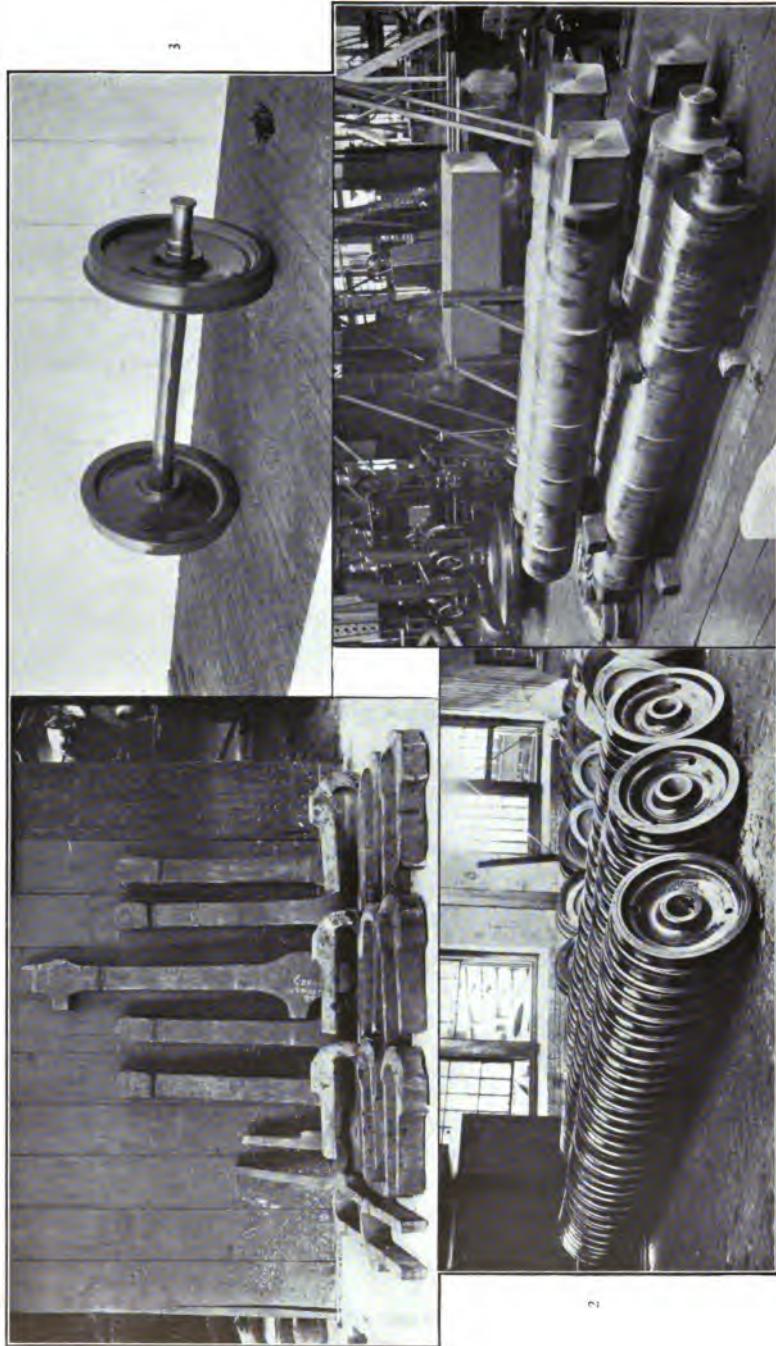
No valuation is given in the census reports for shipbuilding in Philadelphia, but that for Pennsylvania was \$14,000,000 in 1899, \$10,000,000 in 1904 and \$6,000,000 in 1909, practically all of which was in Philadelphia. This does not include those built at the League Island Navy Yard. There has been a large increase in shipbuilding in the last few years, so that it is probable that in 1911 the value was about \$12,000,000.

The Cramp's Shipyard, located in Philadelphia on the Delaware river, near the Penn Treaty Tree, is one of the oldest and largest in the country. It employs as high as 8,000 men at a time, and has turned out about three hundred and eighty vessels. These include thirty-five men-of-war for the United States, a cruiser and a battleship for Japan, six men-of-war for Russia and one for Turkey, beside numerous ocean steamers for the merchant marine. In 1911 it built an 18-knot, 2000-ton cruiser, the "Cuba", and a 1200-ton, 16-knot gunboat, the "Patria", for Cuba. In 1912 it launched the two

3, Wheel and Axle for Central Railway of Brazil
4, Surat Roll Shafts for Honolulu

MIDVALE STEEL COMPANY

1, Side Rods and Straps for Manila Railways
2, Rolled Steel Wheels for Brazilian Railways



sister ships, the "Wyoming" and the "Arkansas", the largest battleships afloat. It is rather curious that the Philadelphia-built Russian cruiser "Variag" should have been sunk in the harbor of Chemulpo by the Russians to prevent its capture by the Philadelphia-built Japanese cruiser "Kasagi", and that the "Retvian" was sunk in the harbor of Port Arthur by the Japanese, but has since been raised and now floats the Japanese flag under the name of "Hessian".

MACHINES

There were eight rolling mills in Philadelphia in 1909 and the value of their products was \$11,789,000. The largest of these mills is that of the Midvale Steel Company at Nicetown. It manufactures armor plate by a method of its own which it has successfully proved



The American Pulley Company

is not an infringement of the Krupp patent. After much controversy it has secured the contracts for the armor plate for the United States' warships. It also manufactures cannon and shells, largely for foreign countries. In marine engineering it also holds a prominent place. The requirements for car wheels under heavy freight and inter-urban trolley equipment have increased to such an extent that it has been found necessary to find a substitute for cast iron chilled wheels. To meet this want, the Midvale Steel Company has made rolled steel pressed wheels for cars, and is furnishing them, not only for home roads, but is also exporting them to Brazil and other countries.

The I. P. Morris Company, now operated by the Cramps, is the oldest machine-building company in the country, having started



PENCOYD IRON WORKS

1—Hawksworth Bridge. 2—Atbara Bridge. 3—Cantilever Bridge

in 1828. It does a great amount of marine engineering work, of which a large part is for export. It has made a hydraulic turbine of 22,500 horse power, which is the highest power hydraulic turbine in the world.

William Sellers & Company has long been celebrated for its manufacture of machine tools. Its planers, lathes, shafting, steam hammers and all the long list of high grade machine tools are in demand not only in this country but in every quarter of the globe, where iron manufacturing is done on a scale large enough to need such tools.

Fifteen years ago pulleys made of wrought steel were such a novelty that engineers hesitated to use them; now they are rapidly taking the place of those made of cast iron or wood. The Ameri-



Ten Carloads of "Planet Jr." Implements for Export—S. L. Allen & Co.

can Pulley Company claims to produce more pulleys than any other establishment in the world, and has a large export trade with Latin American and other foreign countries.

The Pencoyd Iron Works, a branch of the American Bridge Company, is building bridges not only in our own country but also in foreign countries. Among those built by this company are the cantilever bridge at Niagara Falls, the bridge over the Hawksworth river in New Zealand and the bridge over the Atbara river in the Sudan not far from Khartoum. The Atbara bridge has seven spans of 147 feet each and weighs 622 tons. The construction was according to the contract to be completed in six weeks. Men were sent from its own works to erect the bridge which had to be finished in eight weeks after they arrived. The price was one-third less than that of the English competitor.



MACHINE TOOLS FOR EXPORT—
WILLIAM SELLERS & COMPANY

1—Wheel-Turning Lathe

2—Tool-Grinding Machine

3—Planing Machine

4—Drill-Grinding Machine

STREET RAILWAY CARS

The manufacture of cars, while not usually considered an iron industry, is closely allied to it. The value of those made by steam railroad companies in Philadelphia in 1909 was \$5,318,000. The manufacture of street cars in the days of horse railroads was carried on by several firms. That of J. G. Brill Company began the manufacture in 1869; its plant covers thirty-eight acres and its employees number 3,000. It is practically the only firm in this line in Philadelphia, therefore no statistics are given in the census, but it is estimated that during 1909 the value of the cars built was \$4,200,000. As that was a poor year it is natural that there has been a great in-



J. G. Brill Company—Cars and Trucks

crease since that time, and the value in 1911 would be about \$7,000,000.

This firm builds all kinds of cars known to modern street and interurban railroads—double-deck cars for foreign countries, combination open and closed cars, express cars, electric locomotives, sprinklers, snow sweepers, snow plows, funeral cars and horse cars. Particular attention has been given to cars for interurban lines owing to their remarkable growth throughout the country. The Brill Company has kept ahead of all others in adapting the improvements demanded in the business, hardly a year passing without some new car being turned out that is an improvement on those of former years.

This firm exports cars and trucks to almost every country of the world, the value of those exported in 1911 being \$1,250,000. A Philadelphian traveling in Australia, South Africa, Argentina, Brazil or India, seeing cars of the Brill works on the various electric lines, is gratified to find that Philadelphia-made cars are found wherever such conveniences are in use.

The Southwark Foundry and Machine Company, established in 1836 by Merrick & Towne, has the reputation of building the largest engines for the production of steel and iron, for electrical service and blowing engines for blast furnaces and steel works.

The value of electrical machinery, apparatus and supplies produced in Philadelphia in 1909 was \$7,065,000. While Philadelphia

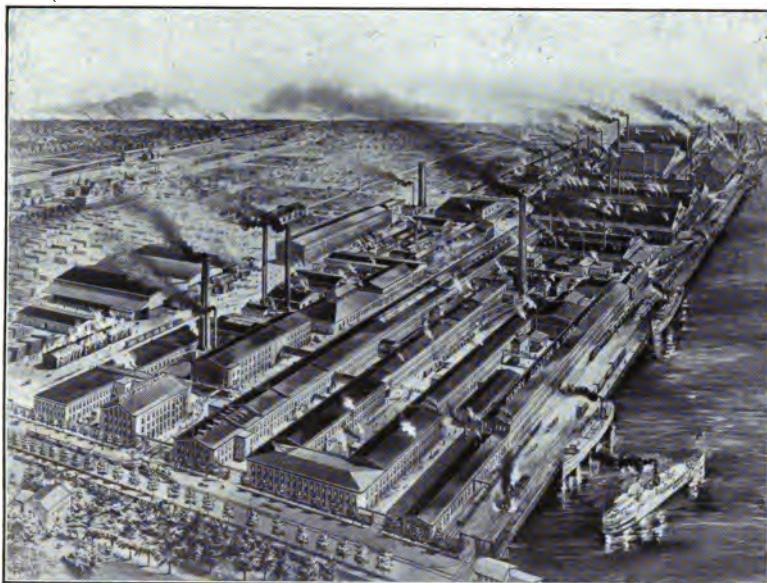


Electric Storage Battery Company

cannot rival Schenectady in the value of this class of goods, yet in the manufacture of storage batteries it holds a prominent place. The Electric Storage Battery Company of Philadelphia is not only the oldest, but the largest, manufacturer of storage batteries in the United States. Its batteries are used in electric automobiles and yachts and by the Marconi and Wireless Telegraph Companies.

TOOLS

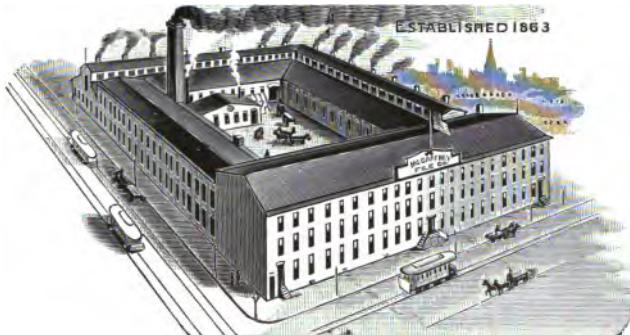
In the manufacture of tools, such as saws and files, Philadelphia holds first rank in this country. Saws were first made in Philadelphia by William Rowland, who started business in 1806. His successors were bought out by Henry Disston in 1840. This plant, located at Tacony, has now an area of fifty acres, on which are fifty-seven



Henry Disston & Sons, Inc.—Saws and Files

buildings. It employs about four thousand workmen and turns out annually nine million saws, including circular, band, crosscut, hand, butcher, hack and compass saws. The annual value of these products approximates \$3,000,000. The Disston firm also manufactures files, of which it uses 30,000 dozens annually.

Previous to 1855, the demand for saws in the United States was supplied almost entirely by foreign manufacturers. The development of the manufacture of saws in this country has been phenomenal, so that for some years past there have been practically no saws of any foreign make imported into the United States, while, on the other



McCaffrey File Company



Fayette R. Plumb, Inc. -Axes and Similar Tools

hand, American-made saws are exported very largely to all parts of the civilized world. It is not an uncommon thing for firms in foreign countries, when asked for the best saw, to give a Disston saw from their stock on hand.

The McCaffrey File Company, started in 1863, possesses one of the most complete plants for the production of files and rasps in the world. It was the first in this country to use exclusively American steel in the manufacture of these products. Fifty years ago 95 per cent of all the files used in the United States was imported; now files are exported from the United States to almost every country of the world. Fayette R. Plumb, Inc., started in 1856, is the largest individual manufacturer of axes, hammers, hatchets and similar tools in the world.

Mease, in 1811, speaking of Philadelphia, said, "All the various



Thomas Devlin Mfg. Company—Malleable Iron Fittings and Hardware



Enterprise Mfg. Company—Hardware Specialties



David Lupton's Sons Co.—Steel Sash



Pennsylvania Lawn Mower Works

edged tools for mechanics are extensively made, and it may be mentioned as a fact calculated to excite surprise, that our common screw auger, an old and extensively useful instrument, has been recently announced in the British publications as a capital improvement in mechanics, as it certainly is, and that all attempts by foreign artists to make this instrument durable have failed." These augers were made by Job T. Pugh, and were the first double twist augers which cleared their way as they bored. To-day, any one on his way to the city on the Pennsylvania Railroad or the Elevated Railroad, looking over to Thirty-first and Market Streets, will see on a high sign, "Job T. Pugh, Auger Maker," and on the side, "Established



Miller Lock Company—Padlocks

1774." From that day to this the Pugh family has been making augers and constantly improving them, so that now, as of old, its augers are not only in demand in this country but abroad.

HARDWARE

In the line of hardware, the Thomas Devlin Manufacturing Company holds a high rank in the manufacture of malleable cast iron and saddlery hardware. The Enterprise Manufacturing Company makes more patented hardware specialties for use in the household, such as meat and food choppers and coffee mills, than any other firm in the world. The Supplee Hardware Company, the manufacturer

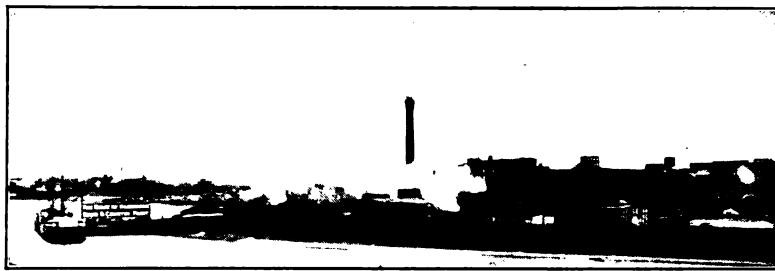
of the Pennsylvania lawn mower, has so improved these machines that they have a high rank wherever lawn mowers are used. The S. L. Allen Company, with its "Planet Jr." farm and garden implements, has perhaps the largest trade in this line in the country. It exports more of this class of goods than any other firm in the United States, and in its large warehouse in Copenhagen probably as many are sold as in Philadelphia. The Miller Lock Company is celebrated for its padlock, of which it makes 20,000 a day. They are not only



Alfred F. Moore—Insulated Electric Wire

recognized as of a high grade in the United States, but have found a market in at least twenty-seven foreign countries.

The manufacture of stoves has long been an important industry in Philadelphia. Franklin, in 1774, invented what has since been known as the Franklin stove, but it was not until the nineteenth century that stoves came into general use. In 1909 there were twenty factories in Philadelphia making stoves, including gas and oil stoves, with a product valued at over \$2,000,000. Philadelphia stoves find a market not only in the United States, but also in foreign countries.



Harrison Bros. & Co., Inc.—Paints and Chemicals

CHEMICALS

The value of the various items included under the census classification of chemicals and allied products manufactured in Philadelphia in 1909 was about \$65,000,000, of which chemicals amounted to \$9,643,000; patent medicines and compounds and druggists' preparations, \$9,423,000; paint and varnish, \$8,045,000; soap, \$7,319,000 and fertilizers, \$4,268,000. In addition, are a number of similar products, like sulphuric and nitric acids, dyestuffs, extracts, explosives, lampblack, animal and vegetable oils and refined petroleum, the values of which are not given in the census.

The chemical industry of the United States was not developed until after the Revolutionary War. The founder, in point of time, was Samuel Wetherill, who manufactured white lead in Philadelphia as early as 1787. John Harrison manufactured sulphuric acid, one of the most important of all chemical products, in 1793. The descendants of these two chemists still manufacture these products in their Philadelphia works. Another old established chemical firm is that of Charles Lennig & Company, founded in 1819, and the first to manufacture alum in Philadelphia. This firm is now largely engaged



Pennsylvania Salt Manufacturing Company

in the manufacture of oil of vitriol and leads in the production of alum and muriatic acid.

Philadelphia leads all other cities in the United States in the manufacture of sulphuric acid. The value for Philadelphia is not given in the census, being included under the head of "All other industries". Besides Harrison Brothers & Co., Inc., which was the first manufacturer, the Pennsylvania Salt Manufacturing Company also manufactures sulphuric acid. It has probably one of the most important individual plants manufacturing sulphuric acid in this country, its works covering about eighty acres.



Charles Lenning & Company—Chemicals

Owing to the diversified industries of Philadelphia, there is a great demand for chemicals in the manufacture of textiles, fertilizers, paint, soap and paper and in the refining of oil and other industries. Every kind of chemical, from the sulphate of copper which sells for half a cent a pound to chloride of gold which sells for twenty-five dollars an ounce, is manufactured in Philadelphia.

PAINT AND VARNISH

The paint and varnish industry may be said to have started with Samuel Wetherill. He was an agent for English manufacturers of

white lead. He succeeded in manufacturing white lead as early as 1787. Later he decided to build a plant for its manufacture, when he was warned that if he did so the English manufacturers would not allow the enterprise to succeed. He was advised to build so that in case of failure it could be readily changed into a brewery. In 1804, a short time after the plant was erected, it was destroyed by fire. The day after the fire a young Englishman in his employ disappeared. It was always believed that he had been bribed by English rivals to set fire to the plant. Nothing daunted he rebuilt in 1808. The interruption of commerce with Europe by the Embargo and Non-Intercourse Acts and the War of 1812 gave Wetherill time to establish the manufacture of white lead on a firm footing.



Bros.
S.—P. Wetherill Company—Paints White lead

Following Wetherill, a number of other firms started the manufacture of white lead during the earlier years of the nineteenth century. Among them may be mentioned Harrison Brothers & Company, Joseph Richards and The John T. Lewis & Brothers Company. The plant of Harrison Brothers & Company, covering thirty-five acres, comprises seventy-two separate factories, fully equipped for the manufacture of chemicals and paint products. It makes not only the average manufacturer's raw materials, but also the materials from which these are made.

The discovery of zinc in New Jersey in 1850, by furnishing a cheap supply of ore from which zinc oxide could easily be reduced,

gave a great impetus to the paint industry. Owing to the fact that the demand for paint in the United States had outgrown the ability of the house painter to work up his colors with slab and muller to the paste form, machine ground lead and colors in oil came into use.

The manufacture of ready mixed paints is an American invention of only a half century ago, and yet the industry has grown so that it supplies not only the rapidly increasing demand of our own country, but is exporting its products to foreign markets; in this export trade Philadelphia firms have a large share.



Samuel H. French & Co.—Paints

The house of Samuel H. French started in 1844 under the name of French & Richards and became Samuel H. French & Co. in 1852. It is the oldest and one of the largest handlers of Portland cement in this country and has carried on a large paint and varnish business for seventy years.

The value of the output of paint in Philadelphia—\$8,045,000 in 1909—is not as large as it should be for the actual amount of trade carried on by the paint houses of this city, because many of them, like John Lucas & Company, have their works at nearby points in this state or in New Jersey, and their output is not credited to Philadelphia.



Smith, Kline & French Co.—Paints Drugs

FERTILIZERS

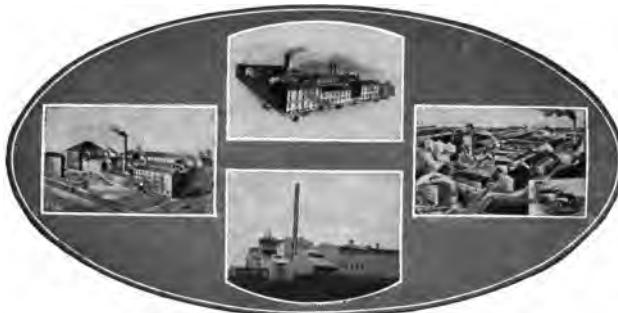
Philadelphia has always held a prominent place in the manufacture of fertilizers. The pioneer and one of the largest manufacturers in this line is the firm of Baugh & Sons, which started nearly sixty years ago and produces 150,000 tons a year. In addition to the phosphate rock from South Carolina and blood and fish from other domestic sources, bones and nitrate of soda are brought from South America, potash from Germany and sulphate of ammonia from England to supply the materials for its works. Shipments of its products are made to all parts of the United States and to foreign countries.

No details of the quantities or values of the different classes of



Baugh & Sons—Fertilizers

chemicals and paints are given for Philadelphia in the census, but as Philadelphia produces 60 per cent of the value for the state, some idea of the quantities produced in this city can be obtained from those for the state. In 1909 Pennsylvania produced 84,273,500 pounds of alum, 51,380,000 pounds of soda, 21,531,000 pounds of copperas and 2,806,000 pounds of cyanides. Unfortunately, no details are given, even for the state, of the quantities of sulphuric, nitric and mixed acids produced. In the line of pigments, there were 18,418,000 pounds of white lead dry, 21,496,000 pounds of oxide of lead, 78,874,000 pounds of iron oxides and other earth and dry colors, and 6,158,000 pounds of pulp colors sold moist. Of paints in oil, there were 32,401,000 pounds of white lead in oil, 29,741,000 pounds of paste, and 3,083,000 gallons already mixed for use. Of varnishes, there were 1,050,000 gallons and of driers, Japans and lacquers, 2,199,000 gallons.



Powers-Weightman-Rosengarten Co. — Medicinal, Technical and Photographic Chemicals

MEDICINAL PREPARATIONS

In 1909 there were one hundred and seventy-four establishments engaged in the manufacture of patent medicines and compounds and druggists' preparations, with an output valued at \$9,423,000, which is about three-fourths of the entire product of the state. No statistics are available for the separate lines of this industry. There are a number of firms in Philadelphia that manufacture patent medicines, such as Dr. D. Jayne & Sons and Johnston, Holloway & Company. The enterprise of one firm has made its preparations known, not only throughout this country, but also in the islands of the Atlantic and Pacific oceans, in Burma, Siam, India and almost every country in Europe.

In the compounding of drugs and the manufacture of druggists' preparations Philadelphia has long held first place. Even in the early days, such firms as Wetherill and Harrison manufactured special

chemicals for druggists. Farr and Kunzi, as early as 1818, manufactured Seidlitz powders, but later became associated with Powers and Weightman in the manufacture of all kinds of chemicals at the Falls of Schuylkill. The Powers-Weightman-Rosengarten Company is one of the largest, as well as the oldest, chemical manufacturing companies in the world. It is the immediate successor of Powers & Weightman founded in 1818 and Rosengarten & Sons founded in 1822. The two concerns were incorporated as one in 1905. This concern has four great laboratories in four different sections of Philadelphia.

Powers & Weightman and Rosengarten & Sons introduced into this country the manufacture of quinine sulphate and morphine sulphate, and their successors, the Powers-Weightman-Rosengarten Co.,



H. K. Mulford Co. — Bacteriological Products

is today one of the largest makers of these products in the world. It also manufactures all kinds of medicinal and photographic chemicals.

Nearly all the quinine consumed in the United States is made in Philadelphia, more being made here than in any other city in the world. The manufacture of drugs for firms in other parts of the United States, which are placed on the market under the names of the firms for which they were manufactured, is also a large trade.

The first biological and vaccine laboratories in America were established twenty years ago in Philadelphia by H. K. Mulford & Company. In addition to its pharmaceutical laboratories in the city it has biological and vaccine laboratories on a large tract of land at Glendon, eight miles from Philadelphia. Here it makes the vaccine virus for small pox and all the various vaccines, antitoxins and curative serums that are now in use in the medical world.

SOAP

While the manufacture of soap has been carried on for a long time in Philadelphia, the amount was trifling in value prior to 1850. During the years 1856-1860, a number of soap factories were started and by means of advanced methods of manufacture, they were able to equal the European product, and drive it to a large extent from the American market. Formerly 95 per cent of the soap used in Philadelphia was of European manufacture; now 95 per cent is made in the United States. In 1909 there were thirty-two soap factories in Philadelphia with an output valued at \$7,319,000, or three-fourths of the total product of Pennsylvania. Philadelphia-made soaps are exported to many parts of the world, and are everywhere known for their superior quality and purity.



Oil Tank Steamer—Atlantic Refining Company

PETROLEUM

The refining of petroleum is one of the important manufacturing industries of Philadelphia. Three pipe lines bring the crude oil from the wells in Pennsylvania, Ohio and Indiana, and mammoth tank steamers bring the crude product from the Texas wells. The oil that comes from Texas is mostly used for fuel.

The plant of the Atlantic Refining Company, at Point Breeze on the Schuylkill river, which refines 60,000 barrels of crude oil a day, has an area of three hundred and sixty acres and a water front of over a mile and a half. It has storage tanks holding from 30,000 to 60,000 barrels of oil and produces more lubricating oil than any other refinery in the world. Besides supplying the needs of the domestic trade it carries on an immense export business. Nearly four hundred vessels clear from its docks annually.

In the year 1909 the value of the petroleum refined in this city was estimated at \$22,500,000, an amount exceeded by only one other



Barrett Mfg. Company—Coal Tar Products

city. In 1911 the value of the illuminating oil exported from Philadelphia was \$14,127,603; of lubricating oil, \$5,124,000; and the value of the total exports of petroleum products was over \$21,000,000, or nearly one-third of that of all the exports. The oil is exported in ships carrying immense quantities of oil in cases direct to Korea, Japan, China, Egypt, Australia and South American countries, so that from the export standpoint it is the most important single product.

The Barrett Manufacturing Company is the largest exporter of roofing products in the United States. The Keystone Lubricating Company has a warehouse in Manchester, England, and agencies in the principal countries throughout the world.



Keystone Lubricating Company

PAPER

The first paper mill in the United States was built in 1690 by William Rittenhouse. It was on a little stream flowing into the Wissahickon, known as Paper Mill Run, in Roxborough township near the boundary line of Germantown. The dwelling in which David Rittenhouse, the astronomer, great-grandson of William Rittenhouse, was born in 1732, still stands not far from the site of the old mill and near the junction of Wissahickon and Lincoln Drives, in Fairmount Park. There was no paper mill in New England until forty years after the Rittenhouse Mill was built.



Rittenhouse Paper Mill

The second paper mill was built in 1710 at Chestnut Hill on the Wissahickon, near where it is crossed by the Reading Pike, by William Dewees, a brother-in-law of Rittenhouse. The third paper mill was built by Thomas Willcox in 1729 on Chester Creek, just below Philadelphia. The paper for the continental money used in the Revolution and the greenbacks used in the Civil War was made at the Willcox mills. Since wood pulp has taken the place of rags in the manufacture of paper, Philadelphia no longer holds its former prominence in the paper industry.



Benjamin Franklin—Printing Shop—1728



Dill & Collins Company—Paper

There were seven mills manufacturing paper in 1909, and the value of their output was \$4,122,000. Of the eight mills operating in Philadelphia in 1912, four are located at or near Manayunk, not far from Roxborough where the first paper mill was located. One



P. Blakiston's Son & Co.—Medical Books

of these, the McDowell mill, is the largest mill in the United States making a specialty of high-grade wrapping paper. The Dill & Collins Company makes the finest high-grade printing paper in this country.

Philadelphia's publishing industry started four years after the landing of Penn. The third printing press in the Colonies and the

first outside of Massachusetts was set up by William Bradford at Schackamaxon, a part of Kensington, in the neighborhood of the Treaty ground in the year 1686. Bradford obtained his paper from the Rittenhouse Mill. Franklin came to Philadelphia in 1723 and started in the printing business. Sauer's German Bible, printed in Germantown in 1743, was the first Bible in any European language to be published in America. The first Bible in the English language with an American imprint was that of Aitken, printed in Philadelphia in 1789.

When the Revolutionary War closed, the printing trade in



J. B. Lippincott Company—Publishers

America was confined mainly to Philadelphia, New York and Boston, and for fifty years after the Revolution Philadelphia was the first in this line. Matthew Carey, at that time the greatest publisher in the United States, was located in this city, and one of his descendants, Henry Carey Baird, still continues in the publishing business. In 1810 this industry in Philadelphia was so large that one hundred and ten wooden presses were kept busy; their output was small as compared to our day, yet, at that time, it surpassed any other English speaking city in the world, except London.

Now, New York and Chicago outrank Philadelphia, but the latter still holds its prominence as a publisher of medical and law books. One of the oldest book publishing houses in this city is that of the J. B. Lippincott Company, which dates back to 1792. In 1849 J. B. Lippincott bought out the then existing firm of Grigg & Elliott and has increased its size and importance until to-day it is the largest book publishing house in Philadelphia. In addition to the enormous plants of the nine dailies are four hundred periodical publishers, the largest being the Curtis Publishing Company, which issues over 1,500,000 copies of the *Ladies' Home Journal* and over 1,700,000 of the *Saturday Evening*



Curtis Publishing Company (Independence Hall in the Foreground)

Post. This firm spends more than a million dollars a year for white paper alone. The Wilmer Atkinson Company issues weekly about a million copies of *The Farm Journal*.

The value of the printing and publishing industry in 1909 was \$45,807,000, or \$19,000,000 more than ten years before. There were nine hundred and thirty-one establishments, employing 21,000 people. The value of the paper and wood pulp manufactured was \$4,122,000; that of paper boxes, \$3,822,000; other paper goods, \$3,597,000; wall paper, \$1,732,000, making a grand total for the paper, printing and publishing and allied industries of \$60,000,000.

Philadelphia ranks first in the manufacture of sand and emery paper, second in the manufacture of paper goods not elsewhere specified and third in the manufacture of paper boxes.

LEATHER

The leather industry is one of the oldest in Pennsylvania, tanneries having been established by the Swedes before the arrival of Penn. Shortly after his arrival, Penn started a tannery in Philadelphia, and in a letter of August, 1683, he speaks of it as being well supplied with bark. The industry of the tanners and shoemakers who were among the first settlers made the tanning of leather and the manufacture of shoes important industries in Philadelphia at an early date. They



C. Bockius Company—Glazed Kid

manufactured not only enough to supply their own wants, but also those of New York and the Southern Colonies. Leather was exported from Philadelphia as early as 1731, and it still is one of the leading exports from this city. The industry increased in Philadelphia to such an extent that for a long time it was the leading leather manufacturing city in the United States, but in 1909 the value of its output was slightly exceeded by that of Milwaukee. The total value of leather and its manufactures for Philadelphia in 1909 was about \$35,000,000, of which leather, tanned, curried and finished amounted to \$23,526,000; boots and shoes, \$6,517,000; other leather goods, \$3,994,000.

Formerly, French kid leather held first rank, but in 1867 a Phila-

delphian received the highest prize at the Paris Exhibition for pebble and brush kid leather. It was not until 1888, however, when chrome tannage came into use, that the greatest success in the manufacture of American leather was attained. A number of Philadelphia firms have



Robert H. Foerderer, Inc.—Glazed Kid

achieved fame and fortune through their manufacture of the various brands of glazed kid. Among these is that of Robert H. Foerderer, Inc., manufacturer of vici kid, whose factory is the largest in the world, consuming some 300,000 patna skins a week.



Burk Brothers—Glazed Kid

More goatskins are consumed in Philadelphia than in any other city in the world, and if Camden and Wilmington are included, both of which are affiliated with the manufacturing interests of Philadelphia, 75 per cent of the world's supply of goatskins are tanned and finished in this locality. The skins come from Spain, India, Russia, China,

Asia Minor, African and Mediterranean ports, Mexico, Brazil, and other South American countries. Last year there were 16,000,000



Leas & McVitty — Sole Leather

goatskins imported direct to Philadelphia in addition to a much larger number entering via New York City. The capacity of the Philadelphia



Sorting Goatskins — Dungan, Hood & Co

factories is over 60,000,000 skins a year. When tanned and finished they are shipped daily to every shoe manufacturing center in the United

States, to England and practically all of Continental Europe, to Japan, China, Australia, South Africa, South America, Mexico and India.



McNeely & Price—Glazed Kid

In the manufacture of sole leather this city also holds a prominent place. Leas & McVitty, established in 1859, has taken prizes at all the great world fairs for the high quality of its sole leather. England & Walton, established in 1850, turns out more cut soles,



John R. Evans & Co.—Glazed Kid

women's and men's, than any other cutter of high-grade scoured oak leather. Dungan, Hood & Company established a hand-work busi-

ness in 1870, but soon adopted machinery after the introduction of chrome tannage and now finishes 12,000 skins daily. Among the numerous firms engaged in the manufacture of glazed kid, each with its own brand, are McNeely & Price, McNeely & Company, Key-stone Leather Company, C. J. Matthews & Company, Burk Brothers, Quaker City Morocco Company, William Amer Company and John R. Evans & Co.

The value of the boots and shoes made in 1909 was \$6,517,000. This value was exceeded by that of a number of cities in New Eng-



Laird, Schober & Co.—Shoes

land and elsewhere. While there are factories in other places of greater capacity than those in this city, there are none in which finer shoes are made. Eighty-two per cent of the shoes made in Philadelphia are for women, misses and children. The high quality of Philadelphia-made shoes is everywhere recognized. More high-grade shoes for women are made in Philadelphia than in any other city in the United States. Philadelphia-made shoes are not only sold in every part of the United States, but are also exported by such firms as Laird, Schober & Co., to Europe, Canada, South America and Australia.

FOOD PRODUCTS

In sugar refining, Philadelphia is the second great center of the United States, its refineries producing over 300,000 tons of sugar annually, with a value in 1909 estimated at \$37,500,000, making it rank fourth among Philadelphia's industries. Sugar refining began nearly one hundred and twenty-five years ago and the bulk of the sugar consumed in the United States in the earlier days was manufactured in this city. Convenience of access for Cuban and other West Indian sugars gave Philadelphia its early preeminence in this line. Sugar is now imported from Cuba, Porto Rico, Hawaii, Java and the



The W. J. McCahan Sugar Refining Company

Philippines. The Hawaiian sugar is sometimes brought in vessels which had carried case oil to Asia from Philadelphia, and sometimes transhipped across the Tehuantepec Isthmus by rail and reshipped to Philadelphia from the port at the Atlantic terminus of the railroad.

In 1909, there were only two refineries in Philadelphia; in 1912, there are four. In normal years about 2,500,000 barrels of sugar are made, sufficient if placed in a row head to head to reach from Philadelphia to Galveston, Texas. There were 466,366,819 pounds of sugar imported in 1911 against 320,660,816 in 1909. It would seem, therefore, that the value of the output of Philadelphia refineries

in 1911 would be at least 40 per cent more than in 1909, or over \$50,000,000.

The Franklin Sugar Refining Company was established in 1864 at Third and Vine Streets, on the site of the first sugar refinery in the United States. It was later removed to its present location at Delaware Avenue and Bainbridge Street. The W. J. McCahan Sugar Refining Company, started in 1892, refines over 100,000 tons of sugar annually.

In the manufacture of bread and other bakery products, there were 1,208 establishments in 1909, with an output valued at \$19,018,000, an increase of \$9,000,000 or 90 per cent over that of 1899. While a number of the bakeries are carried on in very large buildings and sell their products in all parts of the city and suburban districts, most of them are in smaller buildings and serve the wants of their immediate neighborhood. Many of the establishments which manufacture other bakery products than bread, have a large trade in other cities and some of them export part of their products. Philadelphia ranks third among the cities of the United States in the manufacture of bread and bakery products.

There were eighty-one establishments engaged in slaughtering and meat packing in 1909, with an output valued at \$22,079,000, or \$10,000,000 more than in 1899. These establishments are usually on a large scale, which explains the small number for such a large output. Slaughtering and meat packing are not usually thought of as manufacturing industries, but they are so considered by the Bureau of the Census, although the Bureau of Statistics, when treating of the imports and exports of these products, does not class them as manufactured products.

LIQUORS AND TOBACCO

Philadelphia was the first city on the continent to produce malt liquors in large quantities. Penn and others had brew houses on their own grounds. T. Frampton in 1684, followed by Anthony Morris in 1687, were among the first brewers. Francis Perot started a brewery in 1818. Robert Hare manufactured porter and ale as early as 1780. The first lager beer in the United States was manufactured in Philadelphia by Wagner in 1842.

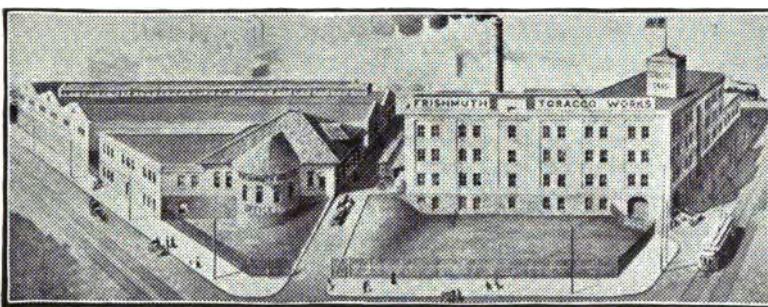
In 1909 there were forty-eight breweries in Philadelphia, with an output valued at \$14,200,000. Some of these are among the largest in the United States; their product is sold to other cities, as well as exported to foreign countries. A number of these breweries are located along the lines of the Pennsylvania and Reading Railroads near Fairmount Park. The brewery interest is so great in this locality that it is sometimes called "Brewery Town".

As there is only one distillery in Philadelphia, no values are given in the census for distilled liquors. Philadelphia is nevertheless one of the leading centers in this country for the sale of distilled liquors.



Brewery District

Large quantities of spirits are shipped to Philadelphia to be rectified. In 1911 over 8,000,000 gallons were rectified in the first Pennsyl-



Frishmuth Brothers & Co.—Tobacco

vania Revenue District, and of this 90 per cent or over 7,500,000 gallons were rectified in Philadelphia.

There were four hundred and ninety-six establishments engaged in

the manufacture of tobacco in Philadelphia in 1909, with an output valued at \$13,429,000. While the average output per establishment is only about \$26,000, there are a number of large establishments in which the value of the output is very great. The plant of Frishmuth Brothers & Co. covers an entire city block. It is the oldest tobacco manufacturing firm in the United States, if not in the world. The business has been under the control of members of this family for over a hundred years.

The values of the products of the seven classes of industries already considered were as follows: Textile industries, including clothing and allied industries, \$240,000,000; iron and steel and manufactures of and allied industries, \$100,000,000; food products, \$85,000,000; chemicals, including petroleum refining, \$65,000,000; paper, printing and publishing, \$60,000,000; leather and manufactures, \$35,000,000, and liquors and tobacco, \$35,000,000; making in all about \$620,000,000, or 83 per cent of the total value of all products.

MISCELLANEOUS INDUSTRIES

The manufacture of furniture doubled in value from 1899 to 1909. In the latter year there were one hundred and forty-seven establishments, with an output valued at \$8,052,000. While Philadelphia cannot equal the quantity or value of furniture manufactured in some of the western cities, it holds first rank for furniture of high-grade. A number of large factories as well as a still greater number of smaller ones all strive to keep up the reputation for high quality attained in the earlier days by the work of Vollmer and others. One of the largest factories is that of Hale & Kilburn.



Hale & Kilburn Company—Furniture

In 1909 there were ninety-eight establishments manufacturing lumber and timber products, with an output valued at \$7,703,000, or 50 per cent more than ten years before. The large building operations in and near the city make a steadily increasing demand for this class of products. Over a million and a half dollars' worth of lumber products was exported from Philadelphia in 1911.

Formerly, Philadelphia made more confectionery than any other



Stephen F. Whitman & Son, Inc.—Confectionery

city in the country, but now it ranks fourth. As far as quality is concerned it still maintains the high reputation it has always held. In 1909 there were one hundred and twenty-nine establishments manufacturing confectionery, with an output valued at \$7,315,000, an increase of \$3,000,000 in ten years. Confectionery made in this city is well-known to lovers of sweets everywhere, and is sold not only in all parts of the United States but is exported to foreign countries. The value of the chocolate and cocoa output is not included under the head of confectionery, but is estimated to be over \$2,500,000.

As a supply of grain for food is one of the first needs of a newly settled community it follows that grist mills should be among the first manufacturing plants established. The Roberts Mill already mentioned, the mill at Frankford and a number of others established along the Schuylkill, Wissahickon and other streams where water power was available each served a large territory. It was customary for the residents of the city to go as far as Germantown or Frankford for their flour. It is told of Lydia Darragh, who overheard British officers plotting an attack on Washington at Whitemarsh, that she made the need of flour an excuse for going to Frank-



Making Chocolate—H. O. Wilbur & Sons

ford to inform Washington of the intended attack. She met one of the patriot officers on the road from Frankford to Whitemarsh and through him warned Washington in time to prevent the proposed attack being a surprise.

To-day most of the flour used in the United States, as well as that exported, comes from the great flour centers of the West. In 1909 there were twenty-eight flour mills in Philadelphia with an output valued at \$2,877,000, or double the value in 1899. One of the oldest mills in Philadelphia, the Millbourne Mills, at Sixty-third and Market Streets, was originally built in 1757.

The manufacture of carriages and wagons, like that of furniture, is now largely carried on in the West, yet there is still a regular demand for Philadelphia-made vehicles because of the high reputation they have for good workmanship. While the value of the output is small in comparison with that of some of the other cities, there were, nevertheless, ninety establishments in Philadelphia in 1909 with an output valued at \$2,458,000.

In the manufacture of umbrellas Philadelphia formerly ranked first, but in 1909 it was second, with an output valued at over \$2,000,000. One of the largest umbrella establishments in the world is to be found in this city.

Philadelphia has always been the leading center for dental



Millbourne Mills—Flour

education and the graduates of its dental colleges are to be found in nearly all the great cities of the world. It is natural they should prefer the instruments and materials they had been accustomed to in their college days. As a result Philadelphia has always held a prominent position in the manufacture of dentists' materials. The S. S. White Dental Manufacturing Company has a large factory devoted entirely to the manufacture of teeth, and keeps an average stock of 7,000,000 porcelain teeth. While no value is given in the census, dentists' materials are classed with those having an output valued between \$1,000,000 and \$5,000,000.

There were glass works in Philadelphia at a very early date, Penn mentioning one in operation in 1683. The Dyottville Glass Works,

established at Kensington in 1771, was in existence until recently. Gillender & Sons, Inc., founded in 1861, was one of the pioneers in the United States to manufacture glass for lighting purposes. There were only four establishments in Philadelphia in 1909, with an output valued at \$1,367,000. This industry is now carried on mainly where natural gas is available. The cut glass industry, for which no values are given in the census, is also carried on by a number of firms in Philadelphia.

There were eight establishments manufacturing ink in Pennsylvania in 1909, all of which were in Philadelphia. The value of the output was over \$1,000,000. The firm of Chas. Eneu Johnson & Co., founded in 1804, was the first to manufacture printing ink in



Tucker Porcelain, 1825. Barber Collection—Pennsylvania Museum, Philadelphia

Philadelphia, if not in the United States. Every variety, from the cheap news inks to the finest grade of art inks, is made by it. Its products are exported to Cuba, South American and other countries.

Philadelphia was once famous for its fine jewelry and silverware, and some firms, like J. E. Caldwell & Co. and the Bailey, Banks & Biddle Company, have a high reputation all over the United States for their fine silver work. They have a large trade in the manufacture of ecclesiastical and historical memorial tablets; also of prizes given in the competitive contests of athletic and other associations throughout the country. The value of the jewelry manufactured here in 1909 was only \$884,000; the value of silverware is not given in the census.

At the present time the manufacture of pottery in this city is

a small industry, the value of the output in 1909 being only \$823,000; yet, historically, Philadelphia is important because here the first American porcelain was made by Tucker in 1825. Prior to that time a number of firms in and around Philadelphia manufactured pottery of various grades, but Tucker was the first to succeed in the manufacture of fine porcelain. He met with many obstacles, some of them through the antagonism of English manufacturers. On several occasions he found most of the handles of his wares in the bottom of the seggars after the kiln was burned. He could not account for this until a man in his employ told him that one of the workmen, whose duty it was to put the wares in the kiln, always ran his knife around each handle as he placed them in the kiln. Another time every piece of china had to be broken before it could be taken out of the seggar; on



The A. Schoenhut Company—Toys and Novelties

investigation he found that one of the men washed the round O's, in which the china was placed in the kiln, with feldspar instead of silex, and as the feldspar melted it fastened every article to the bottom.

Ninety per cent of all the toys imported into the United States comes from Germany, which has given rise to the idea that the manufacture of toys is a German industry only, yet the value of the toys made in the United States in 1909 was \$8,642,000, or more than double that of ten years before. In Germany, while there are a number of large factories, most of the toys are made by hand in the homes of the makers. In the United States the manufacture of toys is entirely a machine-made industry. One of the largest manufacturers in this line in Philadelphia is the A. Schoenhut Company, whose toys are sold in all parts of the United States and exported to foreign countries. Germany ranks third in the purchase of American toys.



H. W. Butterworth & Sons Co.—Textile Machinery

John Behrent, joiner, Third and Green Streets, Philadelphia, made the first piano manufactured in the United States. In 1775 he advertised that he had just finished an extraordinary instrument called the pianoforte. In 1785 James Julian, Fourth and Arch Streets, announced the "great American pianoforte of his own invention." These instruments would seem insignificant in comparison with those of this day; they were, nevertheless, the beginning of a great industry, of which the output in the United States in 1909 was valued at nearly \$90,000,000. Philadelphia's share in this was only \$775,000, and yet a gentleman who is familiar with the piano trade, in both Paris and Philadelphia, says that more pianos are sold in a month between Eleventh and Twelfth on Chestnut Street, known as "Piano Row," than are sold in Paris in a year.



Digesters for a Sugar Plantation in Cuba—R. D. Wood & Co.

The leading department stores are not only large distributors of the manufactured products of Philadelphia but are themselves manufacturers, either under their own name or under that of other firms of which they are practically the owners, and the heads of these department stores can justly be called merchants and manufacturers. They



John Wanamaker—Department Store

are also importers and exporters of manufactured products. Two of these firms, that of John Wanamaker, which is the oldest department store in the United States, and Gimbel Brothers, have branch stores in New York.



1



2



DEPARTMENT
STORES

1—Strawbridge & Clothier
2—Gimbel Brothers, Inc.
3—Lit Brothers

Philadelphia has always been prominent in the various efforts that have been made to develop the manufacturing and commercial interests of the United States. As early as 1775 the "United Company of Philadelphia for Promoting American Manufactures" was formed, and did much by means of premiums, as well as by entering into the actual work of manufacturing, to develop the industries of this country.

In 1824 the Franklin Institute entered upon its career of influence. Its objects, as expressed in its charter, were the "promotion and encouragement of manufactures and the mechanics and useful arts by the establishment of popular lectures on the sciences connected with them; by the formation of a cabinet of models and minerals and a library; by offering premiums on all subjects deemed worthy of encouragement; by examining all new inventions submitted to them, and by such other means as they may judge expedient." It introduced a system of exhibitions as early as 1826 and continued them at regular periods down to 1876.

The Centennial Exhibition in 1876 was one of the first of the international expositions held in this country. It was the outcome of the public spirit and enterprise of Philadelphia's merchants and manufacturers. Nothing has ever done so much to develop the commerce of this country as that Exhibition, and it completely revolutionized many lines of manufacture. It showed American artisans in what points foreign goods were superior to ours, and at the same time it opened the eyes of foreigners to the excellence of American-made goods. Prior to 1876 the United States imported more than it exported, but since that date, with the exception of two years, 1887 and 1888, it has exported more than it imported. To-day the value of the exports of manufactured goods alone is \$1,021,000,000, or nearly double the value of all goods exported in 1876.

The increased interest in art and art education awakened by the Centennial Exhibition resulted in the establishment of the Pennsylvania Museum and School of Industrial Art. Memorial Hall, one of the permanent Centennial Exhibition buildings, contains its fine artistic and historical collections. The Philadelphia Textile School, one of the departments of the School of Industrial Art, is the most complete textile school in the world. It takes up every phase of dyeing and weaving, and does a great work in fitting its pupils for positions of prominence in the textile industries. The Philadelphia School of Design for Women is the oldest and the largest institution of its kind in the United States. The primary intention of the founders was to give women an opportunity to gain thorough and systematic instruc-

tion in practical designing as applied to manufactures. This object has been broadened and now includes all branches of art study which have a business value.

The World's Columbian Exposition was held in 1893, at a time when the foreign trade of the United States had become an important factor in its industrial life. There were exhibited in Chicago at that time collections of raw materials and manufactured products from every nation under the sun. These collections were of great importance, not only because of their money value, but also because of the clear idea they gave of those products of other countries, which were



Gibson Gas Fixture Works

needed in our industries, and the kinds of manufactured products with which the United States would have to compete in the markets of the world.

Dr. William P. Wilson, who was then at the head of the Biological Department of the University of Pennsylvania, while visiting the Exposition at Chicago realized that it was a favorable time to secure materials for a museum of raw and manufactured products, for which he felt there was a growing need in this country. He thought by securing a part of these exhibits and establishing a museum in Philadelphia he would make known to all classes the products of other countries which would be useful to them, whether engaged in agri-

culture, manufacturing or commerce. He called to his aid a number of Philadelphia gentlemen and, obtaining a small appropriation from the Councils of Philadelphia, secured by gift or purchase a large number of the exhibits of various countries, especially those of Mexico, Central and South America. They organized the Philadelphia Museums, more commonly known as "The Philadelphia Commercial Museum," to take care of these exhibits. In December, 1896, the Museums were opened to the public in charge of Dr. Wilson, the present Director, who is continually extending the use-



Making Quilts—Continental Eiderdown Company

fulness of the institution. Since that time fine collections from China, India, Indo-China, Siam, Africa, South Sea Islands, Madagascar and the Philippines were secured from the Paris, Buffalo and St. Louis Expositions and additional exhibits have been donated by Argentina, Japan and other governments.

In 1899 a national exposition of American manufactures for the expansion of export trade was held under the auspices of the Museums in the buildings now occupied by them. In connection with it there was an International Commercial Congress with representatives from thirty-eight foreign governments and from chambers of commerce all over the world.



The Philadelphia Commercial Museum

PHILADELPHIA COMMERCIAL MUSEUM

The object of the Philadelphia Commercial Museum is to disseminate in the United States a wider knowledge of the customs, conditions and needs of other nations, in order to promote commerce between the United States and foreign countries.

Its Foreign Trade Bureau has for its sole object the development of the international commerce of the United States. It does this by encouraging individual manufacturers, who are properly equipped to handle the business, to extend the market for their wares to foreign countries, and then by assisting them in a very practical manner in inaugurating and developing that trade. The assistance given is in the nature of live and practical information on every phase of export trade—its elementary features as well as its technicalities. Large and increasing numbers of letters are received daily from foreign firms inquiring for the names of makers of particular lines of goods in the United States, and asking to be placed in touch with the proper manufacturers. Inquiries of this nature are always cordially invited; they are promptly answered and without charge. The Bureau also has a publication service issuing regularly two journals. *Commercial America*, published in both English and Spanish, circulates abroad with the purpose of inviting the attention of foreign merchants to the advantages of the United States as a country in which to purchase goods. *The Weekly Bulletin* is a confidential publication, circulating only among subscribers to the Bureau, with the purpose of informing them of the wants of foreign importers and merchants.

Its Commercial Library has on file the official statistics and similar documents of nearly all foreign countries, the consular reports of all countries which publish the same, books on general commercial topics, directories of foreign cities and industries, and a large number of the best trade journals published throughout the world. The library is one of the most complete of its kind in the world, of great assistance to the manufacturer and business man, and invaluable to the staff of the institution.

The exhibits in the Museums portray in a vivid fashion the products of foreign countries and illustrate the manners and customs of foreign peoples. They enable the manufacturer to obtain a clearer idea of the raw materials needed in his business than can be obtained in any other museum.

Philadelphia was at one time the metropolis of the United States; it was not only larger in population and in the value of manufactures than any other city, but prior to 1830 it was the leading commercial city of the country. The opening of the Erie Canal, by the great

reduction in freight rates from the West, enabled New York to secure a larger share of that traffic than it had heretofore, and made it, as it is to-day, the largest commercial port of the United States. About the same time the discovery of the usefulness of anthracite as a fuel caused a sudden development of the mining industry of Pennsylvania. This offered more profitable returns for the investment of money than foreign commerce, and led Philadelphians to neglect commerce and devote their wealth and energies to mining, manufacturing and the increasing of transportation facilities. These two causes combined enabled New York to secure the first place in foreign trade,



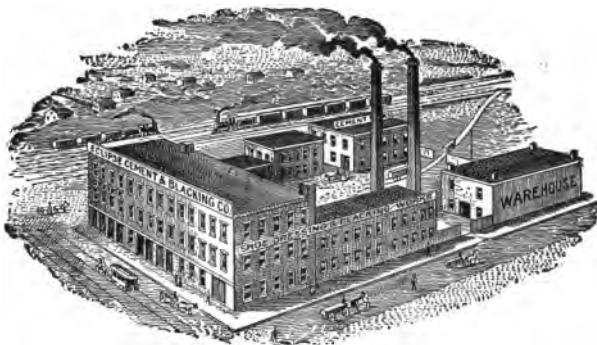
Main Belting Company

which it has held ever since, and to-day a large part of the manufactured products of Philadelphia reach other markets, both at home and abroad, through the agencies of Philadelphia manufacturers in New York.

Philadelphia's location brings the seaboard ninety miles nearer the Southern States and the great states of the Central West than that of New York. The lower rate resulting from the shorter distance is an important factor in building up its foreign trade. Its commerce will increase as soon as the additional facilities needed are provided. Already the city administration, business organizations and leading citizens are giving serious attention to the maritime problems peculiar-

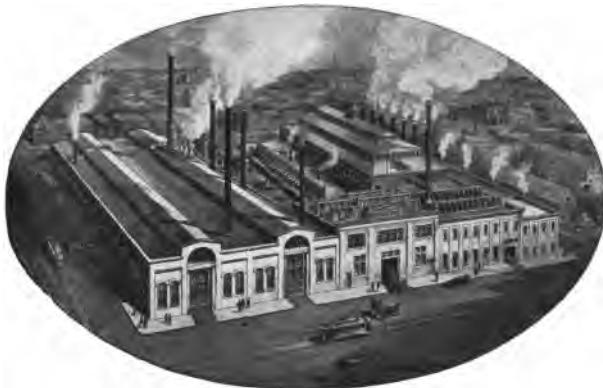
to its situation. In the matter of deeping channels, building wharves and preparing properly equipped terminals, more work is now being done by nation, state and city than ever before.

The deepening of the Delaware river channel, which is already



Eclipse Cement and Blacking Company

an accomplished fact as far as thirty feet are concerned, and which by 1917 will be increased to thirty-five feet, will enable the largest vessels in the freight traffic of the world to enter our harbor. This will have the same effect on Philadelphia as the deepening of their



The Ajax Metal Company

harbors had on Antwerp and Hamburg, making them two of the greatest ports of the world.

The opening of the inland waterway along the Atlantic will bring us in closer touch with the sister cities north and south. This

will lower the cost of delivering our manufactured products to those cities and will enormously increase the traffic with them. The disposition to confine the trade of the country entirely to railroad trans-



Eugene Carraine—Paper Specialties

portation is passing away, largely due to the fact that the railroads themselves realize that they are not able in busy times to handle all the freight offered.



A. M. Collins Mfg. Co.—Cardboard

The opening of the Panama Canal will enable our manufactured products to reach Asiatic markets and those on the western coast of America at a cost much less than at present. The increase of the

LINES OF COMMERCE

foreign and coastwise trade that will follow the opening of the inland waterway and the Panama Canal will add greatly to the importance of Philadelphia as a commercial city and hasten the day when it shall have a share of the exports and imports of the United States commensurate with its importance as a manufacturing center.

Already steamship lines have been established between Philadelphia and southern United States ports and the West Indies, and to London, Liverpool and Glasgow, Hamburg and Bremen, Genoa and Naples, and Antwerp. There sailed from Philadelphia in August a steamship carrying a cargo of general merchandise for Brazil. It was big enough to hold twenty-three locomotives with their tenders, thirty-six steel cars and an immense quantity of steel rails and accessories, the rails alone weighing 1,200 tons. The remarkable fact about the vessel was that over it floated the Stars and Stripes, and that this shipment from Philadelphia is the first departure of a steamship carrying the United States flag and bound for South America that this port has witnessed in half a century and possibly longer. May its sailing be a harbinger of the day when it will be no uncommon sight to see the Stars and Stripes floating over hundreds of vessels sailing out of Philadelphia for foreign ports!

Under the choir of St. Paul's Cathedral, London, where Sir Christopher Wren, its architect, is buried, there is a tablet with this well-known epitaph, "*Si monumentum requiris, circumspice.*" So might William Penn from the tower of City Hall, pointing to the smoke rising from thousands of manufacturing plants in the city which he founded say, "If you seek a monument, look around."



UNITED STATES CENSUS—PHILADELPHIA
STATISTICS OF MANUFACTURES FOR 1909

INDUSTRY	Number of estab- lish- ments	Wage earners (average number)	Capital	Wages	Value of products, 1909	Value of products, 1899
			Expressed in thousands			
All industries	8,379	251,884	\$691,397	\$126,381	\$746,076	\$519,982
Artificial flowers and feathers and plumes	29	804	934	262	1,314	949
Belting and hose, leather	13	119	637	81	1,104	428
Boots and shoes, including cut stock and findings	58	3,466	3,968	1,594	6,517	6,395
Boxes, cigar	7	320	364	125	543	339
Boxes, fancy and paper	65	3,379	2,457	1,113	3,822	2,413
Brass and bronze products	49	1,042	3,214	625	4,057	3,515
Bread and other bakery products . . .	1,208	4,598	14,890	2,592	19,018	10,465
Brick and tile	31	1,369	3,038	786	1,885	1,497
Brooms and brushes	59	409	662	223	1,132	938
Buttons	21	668	551	285	1,159	729
Canning and preserving	23	628	1,528	226	2,538	926
Carpets and rugs, other than rag . . .	84	10,363	22,803	4,722	22,629	21,986
Carriages and wagons and materials .	90	1,316	2,392	839	2,458	2,035
Cars and general shop construction and repairs by steam-railroad companies	10	3,669	4,471	2,527	5,318	3,651
Chemicals	16	1,753	12,997	1,046	9,643	7,810
Clocks and watches, including cases and materials	5	774	2,737	399	1,965	1,455
Clothing, men's, including shirts . . .	456	12,215	14,871	5,962	29,001	22,699
Clothing, women's	351	13,500	10,590	6,574	30,133	9,452
Confectionery	129	2,891	4,264	1,008	7,315	4,355
Cooperage and wooden goods, not elsewhere specified	44	733	1,501	344	2,214	1,503
Copper, tin, and sheet-iron products .	134	2,939	6,511	1,559	7,493	3,300
Cordage and twine and jute and linen goods	8	1,163	3,816	429	3,325	6,162
Cork, cutting	6	60	74	24	106	196
Cotton goods, including cotton small wares	136	9,734	20,868	4,411	22,538	17,620
Cutlery and tools, not elsewhere specified	33	883	2,619	536	1,686	840
Dyeing and finishing textiles	104	3,575	6,179	1,829	6,327	5,562
Electrical machinery, apparatus, and supplies	45	1,759	6,739	923	7,065	4,231
Fancy articles, not elsewhere specified .	42	719	883	296	1,281	760
Fertilizers	6	764	4,346	375	4,286	2,376
Files	7	1,217	2,686	528	1,540	1,014
Flour-mill and gristmill products .	28	89	886	53	2,877	1,369
Foundry and machine-shop products .	545	17,141	56,029	10,135	38,685	* .
Fur goods	47	181	872	129	1,032	676
Furniture and refrigerators	147	3,393	7,451	1,940	8,052	4,511
Gas and electric fixtures and lamps and reflectors	41	1,096	2,083	604	2,177	2,025

* Comparable figures not available

UNITED STATES CENSUS—PHILADELPHIA—Continued
STATISTICS OF MANUFACTURES FOR 1909

INDUSTRY	Number of estab- lish- ments	Wage earners (average number)	Capital	Wages	Value of products, 1909	Value of products, 1899
			Expressed in thousands			
Glass	4	1,112	\$1,252	\$559	\$1,367	\$1,347
Hats and caps, other than felt, straw and wool	42	464	426	188	803	* . .
Hats, fur-felt	27	5,825	13,337	3,101	10,402	3,075
Hosiery and knit goods	177	15,999	18,782	5,753	23,971	13,074
Ice, manufactured	31	535	5,258	375	1,663	895
Ink, printing	8	165	742	105	1,050	408
Iron and steel, steelworks and rolling mills	8	4,821	18,016	2,774	11,789	7,209
Jewelry	52	295	664	186	884	648
Leather goods	84	1,707	2,696	781	3,994	2,708
Leather, tanned, curried and finished	41	5,972	16,523	3,009	23,526	18,187
Liquors, malt	48	1,857	28,676	1,443	14,257	12,607
Lumber and timber products	98	3,248	5,972	1,812	7,703	5,155
Marble and stone work	98	1,619	2,991	1,089	3,464	2,057
Mattresses and spring beds	38	309	603	138	1,069	880
Millinery and lace goods	90	2,770	2,205	956	5,052	1,446
Musical instruments, pianos and organs and materials	14	458	563	155	775	521
Optical goods	14	291	455	123	621	269
Paint and varnish	50	1,197	8,193	689	8,045	7,447
Paper and wood pulp	7	1,301	4,923	629	4,122	2,636
Paper goods, not elsewhere specified	31	1,311	3,169	518	3,597	1,188
Patent medicines and compounds and druggists' preparations	174	2,140	9,752	897	9,423	7,445
Photo-engraving	16	397	523	381	917	296
Pottery, terra-cotta, and fire-clay products	13	585	1,244	345	823	557
Printing and publishing	931	13,681	42,591	8,249	45,807	26,749
Safes and vaults	3	245	506	160	493	565
Shoddy	15	393	1,504	166	1,846	1,285
Silk and silk goods, including throwsters	32	3,056	6,091	1,235	6,502	4,532
Slaughtering and meat packing	81	1,189	4,605	793	22,079	12,096
Smelting and refining, not from the ore	15	121	597	80	1,226	1,092
Soap	32	799	3,651	388	7,319	* . .
Steam packing	15	193	760	100	1,136	769
Stoves and furnaces, including gas and oil stoves	20	846	2,393	550	2,070	* . .
Tobacco manufactures	496	6,545	7,820	2,650	13,429	8,991
Umbrellas and canes	31	1,166	3,413	505	2,075	3,143
Wall paper	4	454	1,368	196	1,732	2,062
Woolen, worsted and felt goods, and wool hats	131	19,177	54,914	7,996	54,922	34,582
All other industries	1,331	40,992	183,308	22,203	183,906	179,875

* Comparable figures not available

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PUBLICATIONS OF THE COMMERCIAL MUSEUM

Philadelphia

Commercial America and América Comercial. A monthly illustrated journal in English and Spanish editions, published for circulation among merchants in all countries, to inform them concerning American manufactures. \$2.00 per year, either edition.

Weekly Export Bulletin, published every week for circulation among American manufacturers and exporters, to inform them of foreign trade opportunities reported to the Commercial Museum. Limited to members of the Foreign Trade Bureau.

Foreign Trade Figures. A Collection of Statistics covering some Features of the World's Commerce and Indicating the Share in it of the United States. 24 pp., paper covers.

Commerce of the World, 1910. An increase of 50 per cent. over 1900. Imports and Exports of Leading Nations. By John J. Macfarlane, Librarian. October, 1911.

The World's Commerce and American Industries. Graphically Illustrated by Eighty-six Charts. Prepared by John J. Macfarlane, A.M., Librarian. 112 pp., paper covers. 1904.

Conversion Tables of Foreign Weights, Measures and Money with comparisons of prices per pound, yard, gallon and bushel in United States money; with prices per Kilo, Meter, Liter, Hectoliter, etc., in Foreign Money. By John J. Macfarlane, A. M., Librarian. (In preparation)

Patent Laws and Trade Marks of Leading Countries of the World. 41 pp., paper covers. October, 1899.

Commerce of Latin America. A Brief Statistical Review. 20 pp. 1903.

Paper and Pulp; World's Export Trade. 50 pp., paper covers. April, 1900.

Cotton Manufactures: The World's Cotton Trade and United States Production. By John J. Macfarlane. 15 pp., paper covers. May, 1907.

Manufactures of Cotton. World's Export Trade. 35 pp., paper covers. 1900.

The Commercial Museum of Philadelphia. By Wilfred H. Schoff, Secretary. 18 pp. 1910.

The Last Speech of President McKinley at Buffalo, Sept. 5, 1901. With extracts from previous speeches regarding the Philadelphia Commercial Museum. 7 pp., paper covers. October, 1901.

Manufacturing in Philadelphia, 1683-1912. Handsomely illustrated with photographs of the principal manufacturing plants in Philadelphia. By John J. Macfarlane, A.M., Librarian. Cloth bound, 101 pp. 1912. \$0.50.

Industrial Philadelphia: From the Infant Industries of Two Centuries Ago to the Giant of To-day. By John J. Macfarlane, Librarian. 12 pp., paper covers. 1912.

Textile Industries of Philadelphia, With a Directory of the Textile and Yarn Manufacturers located in Philadelphia. By John J. Macfarlane. 1910-1911. 50 pp., paper covers. Out of print.

Pan-American Commercial Congress. Report of the Meeting of the International Advisory Board. Dedication of the Museums by President McKinley. 226 pp., paper covers. 1897. \$0.75.

Proceedings of the International Commercial Congress. A conference of representatives from the governments and commercial bodies of nearly every country in the world, invited through the United States Government, by the Philadelphia Commercial Museum, which organized simultaneously the National Export Exposition, to stimulate the American movement for wider foreign markets. 441 pp., cloth binding, richly illustrated. 1899. \$2.00.

Proceedings of the National Export Trade Convention, held under the auspices of the Philadelphia Commercial Museums, at Philadelphia, December 12, 1911. 80 pp., paper covers, \$0.25.

A Few Canal Facts. Compiled by the Philadelphia Commercial Museum, Nov., 1907, for the organizing conference of the Atlantic Deeper Waterways Association. 5 pp.

Foreign Commercial Guide—South America. By Edward J. Cattell assisted by H. S. Morrison and A. C. Kaufman. 284 pp., with outline map of each republic; cloth binding. 1908. \$2.00.

The Republic of Guatemala. By Gustavo Niederlein. 63 pp., with map; paper covers. 1898.

The State of Nicaragua of the Greater Republic of Central America. By Gustavo Niederlein. 93 pp., paper covers. 1898.

The Republic of Costa Rica. By Gustavo Niederlein. 127 pp., paper covers. 1898.

The Philadelphia Museum's Scientific Bulletin, No. 1. Contributions to the Herpetology of New Grenada and Argentina. With Descriptions and new Forms. By Edward D. Cope. Philadelphia. 1899. \$0.25.

Notes on the Madagascar Collection. 15 pp., illustrated, paper covers. 1906. 5 cents.

Hand-book to the Japanese Exhibits—No. 1. For the guidance of visitors to the Japanese exhibits in the Philadelphia Commercial Museum. 32 pp., illustrated. 1912. 5 cents.

The School Museum in its Relation to Geography and Commerce. By Charles R. Toothaker, Curator. Practical Suggestions for School Teachers. 27 pp., paper covers. Free on application. 1911.

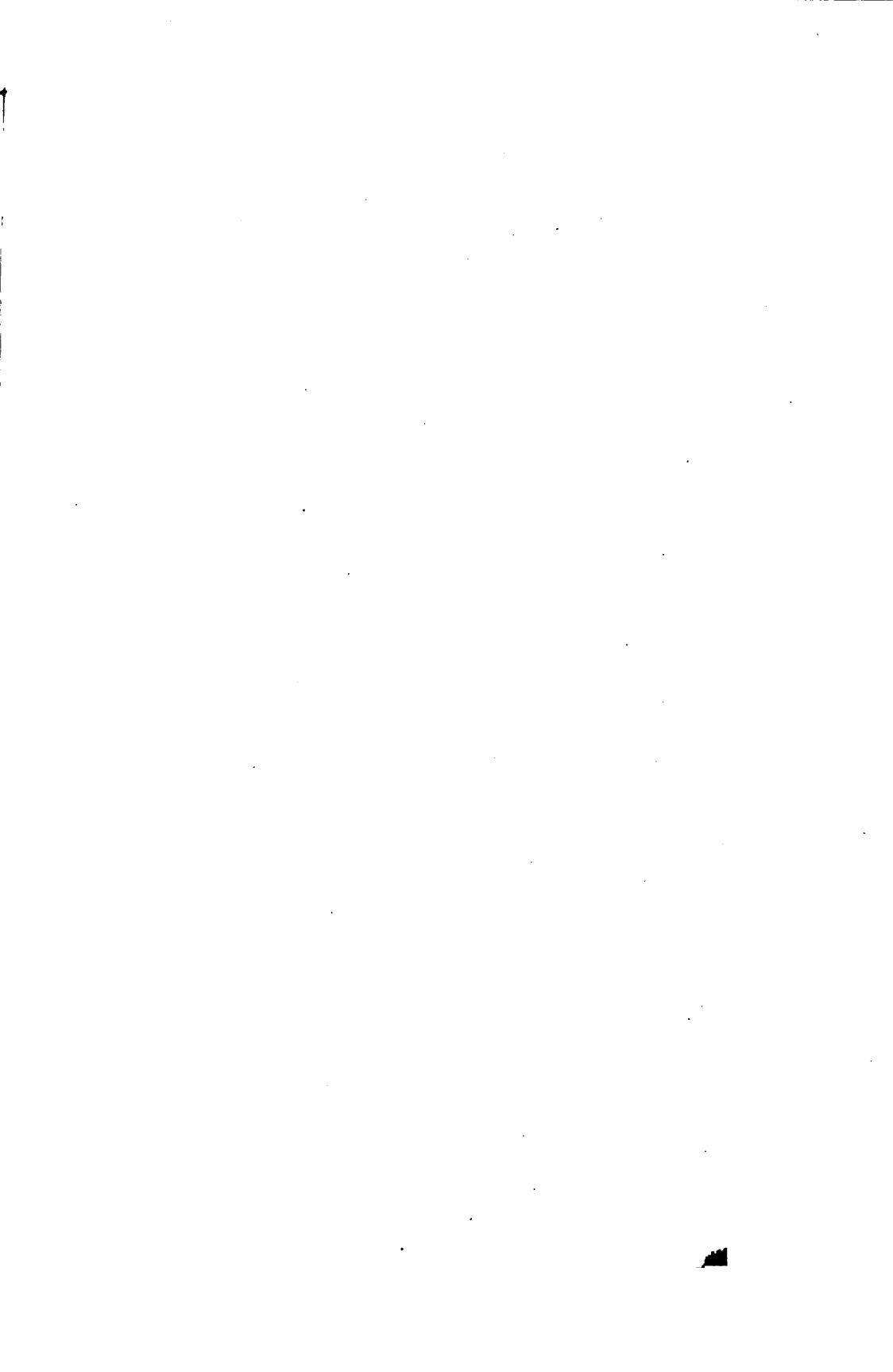
The Peripus of Hanno; a Voyage of Discovery Down the West African Coast by a Carthaginian Admiral of the Fifth Century B. C. Translated by Wilfred H. Schoff, A. M., Secretary. Illustrated. 32 pp., richly printed in two colors on Strathmore Japan paper and covers. 1912. \$0.25.

BY OTHER PUBLISHERS

Commercial Raw Materials. By Charles R. Toothaker, Curator of the Commercial Museum. Boston: Ginn & Co., 108 pp., 1905, \$1.25.

The Peripus of the Erythraean Sea; Travel and Trade in the Indian Ocean by a Merchant of the First Century. Translated from the Greek and annotated by Wilfred H. Schoff, A. M., Secretary of the Commercial Museum. 328 pp., with colored map, cloth binding. New York: Longmans, Green & Co., 1912, \$2.00.





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